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Large Numbers of Overwintering Boll Weevils Reported

Pests Twice as Bad As Year Ago in Four Cotton Belt States

WASHINGTON—In areas of four of the five Cotton Belt states reporting thus far—Louisiana, Mississippi, North Carolina and South Carolina—boll weevils are now more than twice as numerous as they were last spring, U.S. Department of Agriculture surveys show.

The greatest number of live weevils per acre (4,748) in samples taken

(Turn to BOLL WEEVIL, page 21)

Solar to Build Nitrogen Facility Near Joplin, Mo.

LIMA, OHIO — A new chemicals plant, to cost approximately $15,000,000, will be built near Joplin, Mo., by Solar Nitrogen Chemicals, Inc., according to a joint announcement last week by Charles E. Spahr, president of the Standard Oil Co. (Ohio), and Ralph K. Gottshall, president and chairman of the board of Atlas Powder Co.

Solar is owned equally by Standard and Atlas. Edward F. Morrill, vice president of Standard, is president of Solar and of Sohio Chemical Co. Edward J. Goett, executive vice president of Atlas, is vice president of Solar.

Construction of the plant is scheduled to start soon, with completion of the ammonia unit expected in about one year. The plant, which will produce anhydrous ammonia, urea and related products, will be operated by Atlas. The plant's production will be marketed by Sohio Chemical Co., which is both manufacturing and sales agent for Solar's similar plant at Lima, at which a $2,000,000 expansion program is underway.

Adequate Pesticide Supplies Seen for 1960; DDT Output Sets Record in 1959

TABLE 1. U.S. Production of some major Pesticidal Chemicals by Calendar Years, 1957-59

Chemical	1957 1,000 lb.	1958 1,000 lb.	1959* 1,000 lb.
Aldrin, chlordane, dieldrin, endrin, heptachlor, and toxaphene (combined production)	75,424	98,280	86,868
Benzene hexachloride (gross)†	39,559	30,797‖	26,733
Benzene hexachloride (gamma equivalent) †	7,300	6,500‖	5,197
Calcium arsenate	19,478	10,432‖	¶
Copper naphthenate	2,130	1,853	¶
Copper sulfate	141,360	97,192	80,584
2,4-D acid	34,251	30,944‖	29,277
2,4-D acid esters	24,137	21,938)	31,194
2,4-D acid salts‡	3,182	2,964)	
DDT	124,645	145,328‖	156,738
Disodium methylarsonate	618	368	¶
Lead arsenate	11,920	14,938	¶
Methyl bromide	9,653	10,224	¶
Methyl parathion	1,925	5,018	¶
Naban	4,961	**	¶
Parathion ("ethyl parathion")	5,962	5,439	¶
Pentachlorophenol	29,346	35,177	¶
Phenyl mercuric acetate	570	1,056	¶
Sodium chlorate	118,284	134,498	175,330
2,4,5-T acid	5,334	3,678	5,583
2,4,5-T acid esters	6,831	5,230	¶
Ziram	1,277	1,178	¶

* Preliminary.
† 1958 and 1959 include lindane; 1957 without lindane.
‡ Sodium and amine salts.
‖ Revised figure.
¶ Figure not yet available.
** Figure not publishable because it would disclose individual operations.
Sources: U.S. Tariff Commission; U.S. Bureau of the Census; U.S. Bureau of Mines; chemical industry.

WASHINGTON — Barring unexpected demands, supplies of pesticides are expected to be adequate during the 1959-1960 crop year to meet requirements of agricultural and other consumers in the U.S. as well as export trade, according to the annual Pesticide Situation report, issued last week by the U.S. Department of Agriculture.

(A crop year in the report is considered to be the 12 month period ending Sept. 30, the date at which the peak season for pesticide application is past for most of the U.S.)

The report was prepared by Harold H. Shepard, in charge, John N. Mahan, fertilizer specialist, and Charlotte A. Graham, administrative assistant, all of the agricultural chemicals staff, Commodity Stabilization Service, Food & Materials Division, USDA. The following is quoted from the report.

Although the chemical industry is experienced in predicting the market for specific items, it cannot foresee such unusual conditions as sudden heavy outbreaks of insects and plant diseases or quick shifts in consumer demand. For most materials satisfactory alternates will be available whenever inventories and current production of particular items are insufficient from which to fill orders.

Production of DDT was higher in 1959 than ever before, while benzene hexachloride and copper sulfate production was both lower than for many years (Tables 1 and 2).

The industry was on the verge of a shortage of benzene by the time the 1959 steel strike was settled. Its re-

(Turn to PESTICIDE SITUATION, page 8)

California Group Gets Advice on Use of Credit; Importance of Phosphorus Stressed

FRESNO, CAL.—"California growers of agricultural products should make full use of the widespread credit facilities offered by banks and other crop production credit agencies, in their purchases of fertilizer, pesticides, seeds and all of the other vital commodities and services which they must use." This was the theme of Earl Coke, vice president, Bank of America, San Francisco, banquet speaker for the eighth annual California Fertilizer Conference.

The conference, sponsored by the Soil Improvement Committee, California Fertilizer Assn., was held on the campus of Fresno State College, and at the Hacienda Hotel, Fresno, on April 11 and 12. The 300 persons interested in the more technical aspects of plant nutrition and soil fertility were in attendance. (An earlier story of the meeting appeared in the April 25 issue of Croplife.)

C. E. Brissenden, J. R. Simplot Co., Pocatello, Idaho, told the conference that phosphorus is an essential element, even appearing generously in our own bones. Production in 1960 is expected to reach 6 million tons of P_2O_5, with 70% to be used by agriculture and 30% by industry. He outlined the origin and development of phosphate in western U.S.

Dr. Kent B. Tyler, Department of Vegetable Crops, University of California, Riverside, said that the application of phosphorus as a nutrient for vegetable crops became second only to nitrogen in California. "Despite its wide use throughout the state, there are yet areas and instances where the need for phosphorus has not been recognized by the grower."

Dr. Albert Ulrich, Department of Soils and Plant Nutrition, University of California, Berkeley, reported findings in his current three year study on plant analysis research with lima beans. This study, now in its third year, was made possible through a $9,000 cash grant-in-aid from the Soil

(Turn to CALIFORNIA GROUP, page 21)

Risks of Pesticide Development Forcing Research Cuts, Chemical Symposium Told

By LAWRENCE A. LONG
Editor of Croplife

WASHINGTON — Responsibilities of the pesticide manufacturing industry, as well as those of the U.S. Department of Agriculture and the Food and Drug Administration, were outlined in a three-day symposium here Apr. 27-29, on the nature and fate of chemicals applied to soils, plants and animals.

The meeting, attended by technical personnel from USDA, state experiment stations in all parts of the country, state control officials and the manufacturing industry, was sponsored by the Agricultural Research Service of USDA, filling the auditorium of the plant industry station at Beltsville, Md., just outside the capital.

Speaking of the industry's responsibility in the pesticide field, Dr. George B. Ferguson, president, Geigy Agricultural Chemicals, Inc., Ardsley, N.Y., pictured some of the hazards faced by companies engaged in the development and production of pesticides. The industry,

(Turn to CHEMICAL SYMPOSIUM, page 5)

Fire Damages Swift Plant in Virginia

SOUTH NORFOLK, VA.—Fire of undetermined origin recently caused $100,000 damage at the Swift & Co. fertilizer plant here, destroying a frame and metal building and more than 400,000 paper bags.

National Phosphate To Erect New Acid Plant in Illinois

MARSEILLES, ILL. — National Phosphate Corp., through its president, Erol Beker, has announced the details of a large phosphoric acid plant to be erected at Marseilles. The plant is expected to have the highest capacity in the Midwest, the company said.

Construction will commence immediately and the completion date is scheduled for the end of the current year. This will enable the plant to supply phosphoric acid for the next fertilizer season.

The site consists of a large tract centrally located, and having considerable frontage on the Illinois River. The plant will have its own deep water barge dock with loading and unloading equipment.

The plant's production will be marketed by Philipp Brothers Chemicals, Inc., New York, Kenneth D. Morrison, Philipp vice president, said.

GROUNDBREAKING—C. M. Powell, president of the American Agricultural Chemical Co., breaks ground for the firm's new phosphate washer near Pierce, Fla. Looking on are, from left to right, H. R. Quina, maintenance and construction supervisor, F. R. Bergquist, mines manager, and J. S. Gruel, mines superintendent.

AAC Starts Work On New Phosphate Washer in Florida

PIERCE, FLA.—Construction got underway recently on a new phosphate washer at the Palmetto mining location of the American Agricultural Chemical Co., 10 miles southeast of Pierce. C. M. Powell, company president, broke ground.

Also present on the occasion were F. R. Bergquist, mines manager, J. S. Gruel, mines superintendent, H. R. Quina, maintenance and construction supervisor, and N. M. Faulds, mining and washing superintendent.

The new Palmetto washer installation, which will include both washing and recovery equipment, is scheduled for completion in March, 1961. Company officials said it will include recently perfected hydrosizing equipment, to give maximum over-all recovery of phosphate. The hydrosizer was developed by R. D. Evans of the company's metallurgical staff, and is patented by the company.

Washers perform the basic function of separating phosphate-bearing materials from the raw pebble-sand matrix. It is the first step in processing the raw phosphate rock after mining.

Fertilizer Gets Results for Georgia Farmer of the Month

TIFTON, GA.—Glenn Taylor, Tift County farmer, has been named "Farmer of the Month" by the Tifton Kiwanis Club on basis of his good fertilization and cultivation practices on his 145 acres of land in the Brookfield community.

Mr. Taylor, as "Farmer of the Month," will be considered later this year in selection of the Kiwanis Club's "Farmer of the Year," which is an annual project of the civic organization.

Of his 145 acres, Mr. Taylor cultivates 65 acres. He tests his soil and obtains analysis and fertilizer recommendations from the Georgia Coastal Plain Experiment Station in Tifton.

He grows 3½ acres of tobacco, usually making about a ton of leaf per acre. He uses 1,800 lb. of 3-9-9 fertilizer, and finds that this amount of fertilization pays.

He plants six acres of cotton, using 400 lb. 4-12-12 at time of planting, and 300 lb. 12-0-12 for top dressing. He usually makes a bale of cotton to the acre, although in 1959 heavy rains cut his production down somewhat from this record.

He grows 30 acres of corn, making up to 60 bu. per acre, which is above the state and county averages. He uses 400 lb. 4-12-12 to the acre, and top-dresses with 150 lb. of ammonium nitrate.

He grows about 11 acres of peanuts, using 300 lb. 4-12-12, and has six acres of oats and clover, fertilizing with 400 lb. per acre of 4-12-12.

To New Post

BELMOND, IOWA — Mayor L. T. Trafford of Belmond has resigned his post as publicity director with Ris-Van, Inc., fertilizer firm here, to become public relations director with the Farmers Elevator Service Co. at Fort Dodge, Iowa. He has also resigned as mayor of Belmond but will remain in that office until June 30.

California Farm Store Sales Rise in 4th Quarter

SAN FRANCISCO—Sales by California farm stores handling farm chemicals and other farming equipment and supplies rose to $2,117,130 during the fourth quarter of 1959, representing an increase of more than 4% over the corresponding quarter of the previous year.

The division of research and statistics of the California State Board of Equalization found that farm implement dealers increased their sales an average of 3.3% for the two periods, to a new high of $1,351,740. Farm and garden supply stores improved their sales at a more rapid rate—an estimated 7.2%, to a high of $765,390 for the quarter.

Sales for the entire calendar year of 1959 were estimated at $191,751,000 for farm implement dealers, $121,195,000 for farm and garden supply stores, representing a total of $312,946,000. In 1958 sales totaled $166,287,000 for farm implement dealers, and $108,937,000 for farm and garden supply stores, with an over-all total of $275,224,000, or an increase of almost 15% for 1959.

Best to Expand Acid Plant, Build New Super Facility

LATHROP, CAL. — Lowell W. Berry, president of the Best Fertilizer Co., has announced plans for the expansion of the company's sulfuric acid plant. Completion of the new facilities by the end of the year will bring annual capacity to 150,000 tons, or double the present capacity.

Chester L. Wittenborn, assistant company chief engineer, will be in charge of the construction which will also include construction of a granular superphosphate plant of 40,000 tons capacity.

Use of Fertilizer Plays Important Part In Program of Top Sugar Beet Growers

FORT COLLINS, COLO. — Eight outstanding growers who made the 10,000 Pound Beet Sugar Club will be recognized here May 3.

The growers will be presented with production achievement awards, courtesy the National Plant Food Institute, at the Denver Chamber of Commerce Agribusiness Day luncheon at Fort Collins. Colorado State University is cooperating with the program.

One of the growers to be cited, J. P. Schafer of Mesa County, Colorado, made the club by producing 10,670 lb. of beet sugar per acre.

Dr. R. B. Bahme, western regional director of the National Plant Food Institute, said that "Mr. Schafer broke the 10,000 lb. barrier when he produced 32.73 tons beets per acre with a sugar content of 16.3%. He applied fertilizer containing about 80 to 90 lb. phosphate and 120 lb. nitrogen and irrigated early, from one to three times, for germination."

In commenting on his record, Mr. Schafer said, "Exact timing of each individual operation is very important; timely thinning, cultivation and irrigation being the most important. Good seasonal conditions such as we had here on the Western Slope in 1959 did not hurt a bit either."

Dr. Bahme noted that twin brothers Jake and Phil Schlauger of Mesa County, Colorado, also will receive recognition for their production achievement of 10,060 lb. beet sugar per acre.

"The Schlauger brothers made the club when they produced 29.74 tons of beets per acre with a sugar content of 16.19%," Dr. Bahme said.

In accounting for their success the Schlaugers say: "The use of commercial fertilizer helps to maintain high fertility. We think that fertilizer containing phosphate is important to give more weight and more sugar to the beets. We generally put on fertilizer containing about 200 lb. of phosphate per acre and about 130 lb. of nitrogen per acre."

The Schlaugers plowed the ground in the fall and irrigated fairly early for germination. Just prior to, and after thinning, they advocate light irrigations, becoming heavier as the season advances. They also plant as early as possible.

The production achievement awards will be presented by Dr. Bahme and Bill Stewart, extension agronomist, Colorado State University. The other outstanding sugar beet growers to receive recognition are Kenneth Matchett, Walter Nauman, Lloyd and Leo Sommerville, all of Grand Junction, Colo., and Harold Mogensen of Fruita, Colo.

Geigy Announces Personnel Changes

ARDSLEY, N.Y. — Geigy Agricultural Chemicals has announced the following changes and additions to its sales staff.

Larry Harman

Larry Harman has been promoted to sales manager of the northwest sales district. Mr. Harman has been with Geigy since 1947 as a sales representative. He will continue to maintain his headquarters in Walla Walla, Wash.

Roger Scott of Geigy's research staff in Ardsley has been promoted to field research representative in the Pacific Northwest. Mr. Scott will make his headquarters at Yakima, Wash.

Also located in Yakima will be a new member of the sales staff, Gus Poletis. Coming from Grand Junction, Colo. he is experienced in the field of fruit pesticides.

Howard S. Beaudoin has become the sales representative serving the Portland, Ore. area.

Included in the Northwest sales district is Utah and western Colorado. J. B. "Bernie" Plant, who recently joined Geigy as sales representative, will make his headquarters in Salt Lake City.

HERBICIDAL DAMAGES DENIED

LELAND, MISS. — A Sunflower County, Mississippi, jury denied a $150,000 judgment to a man who claimed he was injured by inhaling cotton insecticide in 1956. Charles Lawler, of Leland, Miss., filed suit against an Indianola, Miss., landowner V. A. Johnson; W. T. Skelton, a renter on Mr. Johnson's farm; and J. L. Turk, operator of an aerial application firm.

Mr. Lawler was working on a repair job on a cotton gin at the Skelton farm when he claimed the insecticide aggravated a minor lung condition. Among those testifying was Dr. Mitchell Zavon, Kettering Laboratories, Cincinnati, a consultant for the Shell Chemical Corp. Dr. Zavon told the court that the insecticide could not have caused serious physical harm.

The jury heard five days of testimony and deliberated only 30 minutes before denying the judgment.

John L. Damon to Direct Allied's Ag Chemicals

NEW YORK—The appointment of John L. Damon, previously agricultural chemical sales manager, to the position of director of agricultural chemicals of Allied Chemical's general chemical division has been announced by Frank J. French, president.

John L. Damon

Mr. Damon, with the division 24 years, will assume direction of all activities related to the division's agricultural chemical products, including sales, purchasing, manufacturing and research.

Mr. Damon served in sales, technical service and engineering capacities prior to becoming manager of agricultural chemical sales in 1954. For the previous six years he had been manager of sales for the division's Baker & Adamson line of laboratory reagents and fine chemicals.

Mr. Damon held sales and technical service positions in Philadelphia and Los Angeles before becoming an assistant project engineer at the division's largest works in North Claymont, Del. in 1943. He later served as manager of the division's Washington, D.C. office which operated during the Second World War to serve defense project requirements.

Mr. Damon holds a bachelor of chemical engineering degree from Rensselaer Polytechnic Institute.

NEW PLANT START

MIDLAND, MICH. — Two new plants 2,000 miles apart have begun production of polyethylene film, the Dow Chemical Co. announced recently. Start-up of the plants at Findlay, Ohio, and Fresno, Cal., sets the stage for expanded distribution of the plastic by Dow and its Dobeckmun Co. division.

TVA Makes Barge Shipment of Liquid Mixed Fertilizer

KNOXVILLE, TENN. — A shipment of liquid mixed fertilizer from the Tennessee Valley Authority plant at Muscle Shoals has reached Dubuque, Iowa, by barge on the Mississippi River.

TVA officials said that it was the first shipment of such a commodity to move by barge on the river, and it marked what is believed to be a new and unique practice of the fertilizer industry.

The fertilizer is an 11-33-0 mixture to be used by Ris-Van, Inc., in the distributor-TVA demonstration program, TVA said. The company plans to mix a part of the material with potash to form other grades of liquid mixed fertilizers.

Shipping the material by barge from Muscle Shoals to Dubuque resulted in a saving of more than $6 a ton over other forms of transportation, TVA said.

California Board Considers Changes In Residue Law

SACRAMENTO—Following a public hearing, the California Department of Agriculture took under advisement a proposal to tailor California's standards of pesticide residues to match the complex federal food and drug regulations in this field.

The new state regulation, if approved by William E. Warne, director of agriculture, will go into effect as early as July 1, 1960.

The proposed change originated with the department, which has found it increasingly difficult to administer California's outdated residue laws and at the same time maintain the state's high standards for farm produce in the face of tightening federal restrictions.

Allen B. Lemmon, chief of the division of plant industry and presiding officer at the hearing, said state inspectors have solved the dilemma in practice simply by enforcing the federal standards. Officially adopting them will make little practical difference for growers and sellers of most crops, he said.

He added, however, that two groups, dairymen and hay growers, will be vitally affected. Because of jurisdictional problems among enforcement agencies and vagueness in the state law, California's legal tolerance for DDT and similar chemical residues on dairy feed is seven parts per million. But there is no federal tolerance for these materials on hay and, even more important, federal law permits no trace of DDT in milk.

"All we want is for feed growers to have the same standards that are applied to us," a dairy industry spokesman said.

"Before you adopt the federal standards, wait until a standard and stable test is devised so we know where we stand," one hay dealer told hearing officials. He referred to the chance that tests might be influenced by the residue which could drift onto a hay crop from adjoining fields.

"Our goal," Mr. Lemmon told the group, "is to establish reasonable tolerances which give protection to the consumers and also give to farmers a chance to use necessary chemicals."

GARDEN CENTER OPENS

ELKO, NEV.—Gregory's Garden Center has been opened here by Mrs. Bernice Gregory and Jim Gregory, owners of Gregory Floral here. The new firm offers fertilizers, weed killers, insecticides, rental cultivating equipment, also shrubs, trees and rose bushes.

Louis H. Wilson Cited by National County Agent Group

WASHINGTON—Louis H. Wilson, secretary and director of information for the National Plant Food Institute, Washington, D.C., has been awarded a citation by the National Association County Agricultural Agents for his "untiring efforts . . . valued counsel and advice and productive service in the improvement of American agriculture." The citation was the first award presented in the 44-year-old history of the association.

The presentation was made by Orville F. Walker, immediate past president of the association and district marketing agent, Gaylord, Mich., at a luncheon for officers and directors of the National Association County Agricultural Agents, attended also by Irvin L. Peterson, assistant secretary of agriculture and officials of the Federal Extension Service, U.S. Department of Agriculture.

Mr. Walker in presenting the citation described Mr. Wilson as "one of the best public relations men for agriculture we have in the country" and added that he "has played a very important part for many years in giving of his time, energies and knowledge to the work of our national association . . . has worked back of the scenes for many years advising the officers and boards of directors on public relations problems of the association."

Carl E. Rose, president of the association, introduced Mr. Walker and said that his organization was "grateful that we have an organization such as yours (the Institute) to lean on for help when we need it" and "we are grateful that you have the type of individual that you have as secretary and director of information."

Mr. Wilson accepted the award "on behalf of the Institute and its members who have encouraged and made possible the fine working relationships with the county agents, one of the most important groups in the nation influencing the welfare of agriculture and, consequently, the welfare of the entire economy."

STORE DESTROYED

BISHOPVILLE, S.C.—The Hearon Farm Supply Co. here was gutted by fire April 18. The entire building was enveloped with flames when firemen arrived on the scene shortly after midnight. The blaze apparently started in the rear of the farm supply house which contained fertilizer, insecticides, soybeans, seed and other farming items. It spread and destroyed three nearby residences. Roland Hearon, who operated Hearon Farm Supply, said his loss was "considerable."

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INSECT, PLANT DISEASE NOTES

South Carolina Farmers Alerted to Epidemic

CLEMSON, S.C.—Tomato and potato growers in South Carolina have been warned to combat a major epidemic disease threat by starting a fungicide program immediately using maneb, zineb or copper.

The possible epidemic has been caused by illegal shipments of tomato plants from South Florida, according to W. M. Epps, state pathologist. The state crop pest commission has issued several warnings to growers against purchasing prohibited South Florida plants.

"The crop pest commission has attempted to prevent entry of plants from restricted counties and will continue to do so. But reports from growers and from Clemson extension personnel indicate that many have been brought in," Mr. Epps said.

Fungicides should be applied at five to seven day intervals and the normal recommendations call for the treatment program to begin when the plants begin to bloom.

"Potatoes are also susceptible to the disease and all commercial potato acreage should be sprayed or dusted regularly," Mr. Epps said.

Winter Acts as Insecticide For Oklahoma Farmers

OKLAHOMA CITY, OKLA.—Very little spraying of wheat for green bugs has been done this year in Oklahoma as nature took care of the situation, explained Clyde Bower, entomologist for the State Department of Agriculture.

"We had a big potential for heavy green bug infestation," Mr. Bower said, "but the best way to control them is to go directly from winter into summer without any spring, which is what happened in Oklahoma this year. We went from the prolonged snowy spell into 80° weather and the green bugs couldn't take it."

Most spraying this year was in barley and oat fields.

Mr. Bower warned farmers that "now is the time to get rid of the weeds."

Aphids Continue Buildup In Georgia Counties

ATHENS, GA. — Alfalfa weevils were infesting alfalfa at 45 larvae per sweep of the insect net in Oconee County. A treated field in Oconee County had less than one larva per bud. Light to heavy infestations were seen on alfalfa in Polk, Cherokee, Troup, Gordon and Jasper counties.

Light billbug infestations were found on corn in Colquitt, Brooks and Pierce counties.

Plum curculio adults continue to leave hibernation in numbers. As many as an average of 2.5 adults per tree were caught in a commercial peach orchard on April 15. Eggs were found in peaches in orchards here on April 20. Peaches here are now ready for the shuck-off or second spray for plum curculio control.

First generation of oriental fruit moth larvae are appearing here. A larva about one week old was observed in a green peach from an orchard at Fort Valley on April 18.

Pecan leaf casebearer infestations were found on pecan trees in Lowndes, Ware, Pierce, Wayne, Tattnall, Evans and Bulloch counties.

Light to moderate imported cabbageworm infestations were noted on cabbage in Colquitt and Brooks counties.

Heavy bean leaf beetle infestations were found on beans in Colquitt, Brooks and Lowndes counties, and light Mexican bean beetle infestations on beans were found in those counties.

Heavy wireworm infestations were spotted on tobacco in the field in Berrien and Colquitt counties.

Light to heavy green peach aphid infestations on tobacco in the field were found in Tift, Berrien, Cook, Colquitt, Brooks, Lowndes, Ware, Pierce, Tattnall and Bulloch counties.

Tobacco flea beetle infestations were noted in the above mentioned counties.

Budworm infestations were found on tobacco in the field in Ware County, and eggs were observed in most fields surveyed in the above mentioned counties.

Light to moderate thrips infestations were seen on cotton in Tift, Berrien, Colquitt, Brooks, Pierce, Tattnall and Bulloch counties.

Face Fly Found In 3 Iowa Counties

AMES, IOWA — Observations on insect activity were made by the Iowa State University entomology staff during the period ending April 23.

The face fly has been identified by Dr. J. L. Laffoon from three locations in eastern Iowa—in Muscatine, Louisa and Des Moines counties.

One army worm moth was taken in the light trap at Ames April 22.

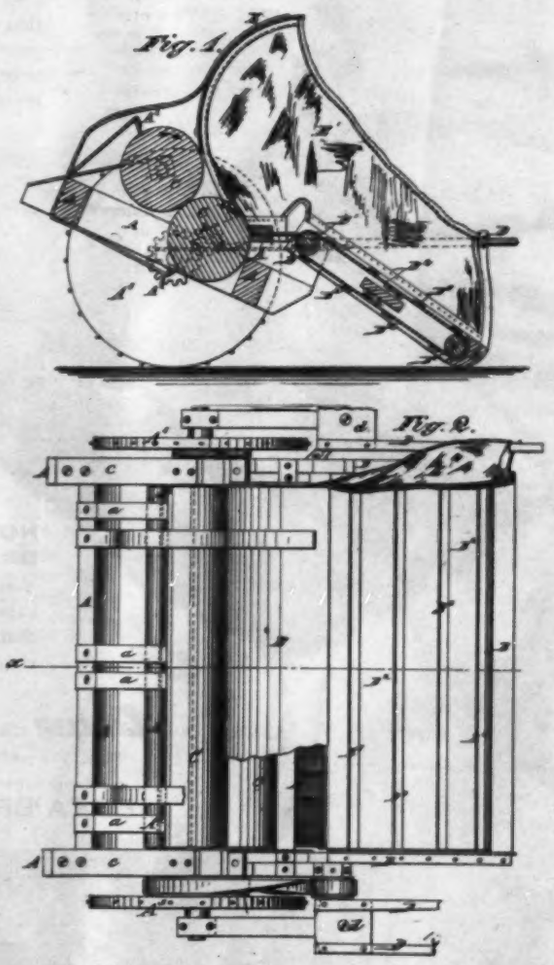
Seed corn beetles have been flying in moderate to heavy numbers during the past week. Kansas also reports heavy flights of this pest. This may indicate a need for seed or soil treatment with aldrin or heptachlor.

Clover leaf weevil larvae averaged one newly hatched larva per plant in alfalfa and red clover fields in Iowa and Poweshiek counties.

June beetles began flying in central Iowa on April 22. The adults feed on leaves of shade and fruit trees.

Wingless grasshoppers were reported in Sioux County. These are probably native prairie grasshoppers which live through the winter as partly grown nymphs. They are never abundant enough to cause economic loss in Iowa.—Harold Gunderson.

Saga of Insect Control



A CRUNCHING DEMISE was in store for the luckless grasshopper which got tangled up in the "insect destroyer" invented and patented by George B. Drum, Syracuse, Neb., in 1877. The device, shown in the above drawings, consisted of a vehicle containing a combined catching and destroying mechanism to be drawn about the field for killing insect pests. A sort of conveyor belt fed the bugs upward and dumped them into the wringer-like rolls. All moving parts were driven by gearing from one of the wheels, and the smashed remains of insects were to be dumped on the ground as the machine progressed through the field. Or, the inventor notes, "if it is desired to collect the insects for any purpose, a bag may be attached to the frame (A) by hooks or otherwise, below the rolls."

A scraper worked against the rolls to keep them clean.

Numerous Seed-Corn Beetles Noted in Kansas

MANHATTAN, KANSAS — Large numbers of seed-corn beetles have been observed flying in recent weeks on warm afternoons. They have been reported from Rice, Jefferson, Riley, Shawnee and Pottawatomie counties. The abundance of these beetles indicates a need of insecticide seed treatment on corn and sorghum this spring. Insecticide treatments alone or in combination with a fungicide will prevent damage to seed before germination.

Brown wheat mites were observed in some of the wheat fields examined in Haskell, Seward, Stevens, Morton and Stanton counties. Infestations were most common in dryland continuous fields and volunteer. In general, mite populations were light.

Pea aphids were found in all alfalfa fields examined in southwest Kansas recently. Counts ranged from five to 300 per sweep. Fields of alfalfa varied from 8 to 14 in. in height so there was considerable difference in maturity of individual fields which could also indicate field differences on populations and damage. Last year the heavy population of pea aphids was reached the week of April 29 to May 2. Alfalfa fields should be watched closely for wilted spots in the field.

Ladybird beetles are present in most fields with less than one ladybird beetle per sweep.

Green bugs were found in 44% of the wheat, oat, barley and rye fields examined in southeastern Kansas. Counts ranged from none to less than one greenbug per linear foot. A single wheat plant infested with three greenbugs was observed in Seward County. No greenbugs were found in wheat near Haya.

The results of winter injury to overwintering European corn borers indicate 75% death of borers this winter. This is about the same as the 1955-56 winter and much better than the 48% destroyed in 1959.

Spotted alfalfa aphids were found on one roadside embankment in Crawford County and one roadside embankment and field in Chautauqua County. Counts averaged less than one per sweep.

Codling Moth Pupation Complete in Indiana

VINCENNES, IND.—Codling moth pupation is practically complete at this time.

The highest orchard mite population noted to date was 60 mites per 100 leaves on a block of golden delicious apple trees. Populations at this time are determined by the effectiveness of last year's mite program and the effectiveness of early season control this year.

Green apple aphids are already curling leaves and exuding generous amounts of honeydew on some blocks in the area.

Red-banded leaf roller activity has been light; eggs hatched recently.

It is time for plum curculio to be active at Vincennes but, as yet, none have been bumped from peaches. Stink bug populations are increasing, while tarnished plant bugs are decreasing in peach orchards.—Merrill L. Cleveland.

CHEMICAL SYMPOSIUM

(Continued from page 1)

he said, is re-evaluating its position as well as its responsibilities.

"Some large chemical corporations have either cut back or abandoned research in this field and others are considering following suit," he declared. The number doing this type of basic work are few on a world-wide scale, and "Basic research by the smaller chemical companies is virtually non-existent," he said.

Yet, Dr. Ferguson continued, all companies must make a profit to remain in business. Pesticide sales represent only about 2% of total chemical industry sales, and because of this, financial management is reluctant to take large risks in a field which represents such a small part of an industry.

Such risks include high investment in development of products and in plants to produce the material, problems in obtaining adequate liability insurance, problems in product obsolescence through insect resistance or other factors and the possible rescinding of tolerances once established.

Dr. Ferguson expressed doubt that safety requirements can be legislated. Evaluation of safety is a constantly changing thing, as new products and new data become available.

"It requires expert scientific judgment, not legislation," he said. "There is no question but that conservation must prevail in any approach to the problem of public exposure to chemicals in foods, but the 'rule of reason' must be used in arriving at conclusions within the framework of existing scientific knowledge.

"If unnecessary restrictions should force free enterprise out of the pesticide field, then the development responsibility will undoubtedly fall on government agencies and we will be one more step on the way to socialization. Pesticides are one of the essential links in the chain of food production, and it is of course axiomatic that a chain is only as strong as its weakest link."

Sound scientific consideration must be given all factors related to the pesticide residue problem associated with insect control, a U.S. Department of Agriculture scientist told the symposium.

Dr. Edward F. Knipling, director of entomology research for USDA's Agricultural Research Service, said this approach is necessary if the nation is to take full advantage of recent scientific advances in control of insects that prey on food and feed crops and livestock.

The importance of producing high quality foods free of hazardous residues cannot be overemphasized, he said. Dr. Knipling pointed out that under existing law use of a particular insecticide must be not only non-hazardous to man, but must also meet other requirements of law.

The over-all picture of the insecticide hazard painted in popular or scientific publications by some alarmists is more imaginary than real, Dr. Knipling said. "This has led," he stated, "to more stringent laws and rigid interpretations of such laws regulating the use of insecticides and other pesticides. As a result, we face a growing problem in our efforts to maintain essential control of insect pests with currently available methods, and to develop new ones."

In discussing the hazards of insect control, the scientist said there was not a single case of chronic poisoning of man proved to be caused by insecticide residues in foods.

"Local adverse effects on fish and wildlife may result from the use of certain insecticides, and every effort must be made to avoid such losses," Dr. Knipling said. "But contrary to implications by some writers, I have seen no evidence of an over-all decline in the nation's resources of fish and game that can be attributed to insecticides."

Dr. Knipling pointed out that, in most instances, adverse effects of chemicals on beneficial insects, parasites and predators have been temporary, and there is no evidence of any general upset in the balance of beneficial and destructive insects.

The public is entitled to both high standards of insect control and high standards of safety in control procedures, Dr. Knipling said. If the public is convinced that the many highly effective and proved methods of insect control do not provide the standards of safety, he said, it must be prepared to support research to develop more acceptable methods, or to accept short supplies, inferior quality and higher prices for many foods.

The resources available for agricultural research, said Dr. Knipling, have made it impossible to meet current problems and at the same time begin laying a firm foundation for better long-range solutions to insect problems.

Need for well-coordinated research between biologists and engineers to determine the optimum placement of chemicals for most effective control of pests was stressed by an engineer of the U.S. Department of Agriculture.

Dr. Walter M. Carleton of USDA's Agricultural Research Service said more efficient equipment for applying chemicals is needed, but engineers are hampered in developing such equipment by a lack of basic knowledge about the behavior of materials during and after application.

Thus, increased basic research is needed, he said, to determine the complex effects of physical factors on the movement of chemical particles from the time they leave the applicator until they are deposited. In addition to the size and weight of particles, these factors include aerodynamic forces, the forces of gravity, inertia, electrical charges and temperature differences.

Dr. Carlson said that improved equipment to deposit chemicals in pre-determined locations would not only increase the effectiveness of pesticides, but would also reduce substantially the amount needed for optimum control. This, in turn, would reduce the cost to farmers and reduce drift and residue hazards to man, animals, beneficial insects and crops, he said.

Scientists need to know more about the persistence of herbicides in the soil under various environmental conditions, another USDA scientist said.

Herbicides applied to the soil often change markedly within the soil, Dr. Thomas J. Sheets of USDA's Agricultural Research Service said. Knowledge of the toxicity of these changed chemicals to man and animals is essential, he added, because the compounds may be absorbed by plants used as food. It is also important to understand how herbicides change in the soil, how long they stay there, and what they do to the soil and the plants.

Dr. Sheets suggested more research using radioactive isotopes, gas chromatography and other methods of detecting minute amounts of herbicides and their breakdown products in the soil. Carbon-14, for example, could be used to tag various herbicides so their breakdown products could be isolated, identified and studied. The findings of this laboratory research would lead to better predictions for dosage requirements of soil-applied herbicides, he said. The results would then have to be evaluated in the field before recommendations could be made.

As new herbicides are developed, their behavior in the soil in relation to soil characteristics, weather and cultural practices must be studied to support safe, effective recommendations to farmers, Dr. Sheets concluded.

Basic knowledge about parasites is needed before chemical control of such pests can be most effectively expanded, Dr. Aurel O. Foster of the Agricultural Research Service said.

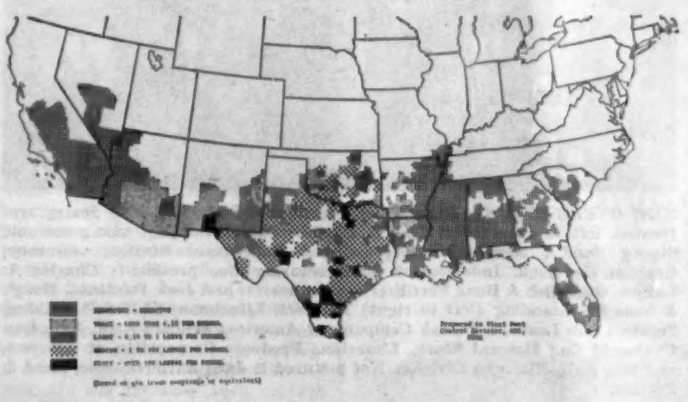
Scientists have learned how to control only about a third of the more than 300 economically important animal parasites, Dr. Foster said. Reliance is now placed almost entirely on chemicals for parasite control, he said, but comparatively little is known about the life processes of the parasites themselves or how various drugs act on them. The chemicals now in use, he added, are safe for animals and humans, but these chemicals are far from perfect.

Parasite control research takes a good deal of time, effort and money, Dr. Foster added, because safety to consumers has long been the primary criterion of parasite control recommendations for the use of chemicals containing such elements as arsenic, lead, fluorine and cadmium. Although diseases like tick fever have been virtually eradicated from the United States by the use of chemicals to control their insect vectors, parasites still cost American farmers more than $1 billion each year.

Armour Promotion

DAVENPORT, FLA.—L. W. Jones has been promoted to sales aide in the Davenport division of Armour Agricultural Chemical Co., and will assist in the supervision of Armour's fertilizer sales activities there, announced G. W. Gosdin, Davenport division manager. A business administration graduate of the University of Florida in Gainesville, Mr. Jones joined Armour Agricultural Chemical Co. in 1949. Since August, 1950, he has been engaged in company sales work in Polk, Highlands and Glades counties in Florida.

STATUS OF THE PINK BOLLWORM INFESTATION AS OF JAN. 1, 1960.



Oregon Red Cedar Buys U.S. Guano

ROSEBURG, ORE.—Lynn H. Andreas, president of Oregon Red Cedar Inc., announces the purchase of the U.S. Guano Corp., which deals in organic fertilizers, and all its physical assets for a price in excess of $100,000. Purchase was made from industrialist Frank Ruben.

The Guano company will be incorporated into the Oregon Red Cedar company. Main offices will be maintained in Roseburg, but warehouses, already established, will be in Sacramento, Cal., according to Mr. Andreas.

Mr. Ruben's headquarters for the company were in Kingman, Ariz. near the source of the product. The trade name of Guano will continue to be used for the fertilizer, made from bat manure obtained from the many caves along the Grand Canyon of the Colorado River.

In purchasing the Guano company, Mr. Andreas said he acquired rights to all guano in the canyon held by the company. He stated that the purchase included more than 500,000 packages of the fertilizer in various sizes from one pound up to five pounds, all of which is available to the market. He purchased the company's entire assets, located in Portland, Spokane, Seattle, San Francisco, Los Angeles, Huntington Park, Cal. and Kingman.

Mr. Andreas stated that the fertilizer will be handled by major outlets over the nation. He said the company will have 1,850 dealer outlets in California, Arizona, Washington, Idaho, Oklahoma and Texas. He will also line up additional outlets in the Pacific Northwest.

Pacific Northwest Regional Conference Plans Set

PORTLAND, ORE. — Preliminary planning for the program of the regional fertilizer conference sponsored by the Pacific Northwest Plant Food Assn., and to be presented July 13-15 at the Hotel Utah, Salt Lake City, is making satisfactory progress, the association office reports.

The official conference program will commence at 9 a.m. Wednesday, July 13, hence those planning to attend the event should schedule their arrival no later than Tuesday evening. The program will continue throughout the day Wednesday and will be featured by a noon luncheon.

At 9 a.m. July 14 a field trip to the agronomy farm of Utah State University at Logan, will be conducted. This will continue throughout the entire day and delegates will return to the Hotel Utah in time for an allied trades social hour at 6 p.m. The annual conference banquet has been scheduled for 7 p.m. July 14.

The July 15 agenda will feature a morning technical session with conference adjournment set for 11:30 a.m.

JOHN CAVANAUGH DIES

KANSAS CITY — John Francis Cavanaugh, 65, former vice president and sales manager of the industrial chemicals division, Thompson-Hayward Chemical Co., Kansas City, died April 22 at Phoenix. Mr. Cavanaugh retired about three months ago and had been living in Phoenix. He apparently suffered a heart attack. Mr. Cavanaugh was with the Thompson-Hayward firm for 38 years in various sales capacities.

PILOT KILLED

ENGLAND, ARK. — Frederick Charles Moore, Jr., 34-year-old crop dusting pilot, was killed April 23 when his plane crashed on a farm two miles southeast of here. Officers said Mr. Moore, a pilot for the Mopyco Flying Service of Keo, Ark., was sowing rice seed on the John Add Cantrell farm when the accident happened.

Western Needs Continue . . .

Improved Soil Fertility Key to Solving Range Shortage Problem

By DR. R. MERTON LOVE*
Chairman, Department of Agronomy
University of California, Davis

THERE IS ABUNDANT evidence concerning the importance of the grazing lands of the United States. They occupy approximately a billion acres compared with 350 million acres of all harvested crops. According to authorities, the 1956 value of all livestock products sold amounted to $16,250,307,000 compared with $14,122,190,000 from crops, including forest products.

In the seven westernmost states the 9.9 million head of cattle and 6.4 million head of sheep were responsible for a $2.03 billion contribution to the agricultural economy in 1958, according to a recent survey (Table 1).

Unfortunately, except by indirect means, there is no way of estimating the contribution of grazing lands to the 53.5% of the agricultural wealth of the nation. Indirect estimates of annual production data on the 1,000 million acres of grazing land have been made. These vary from $5 to $10 billion. We need more complete information concerning the contribution made to our economy by grazing lands.

Feed makes up about 50% of the cost of producing milk and about 80 to 90% of the cost of producing beef, pork, lamb, and poultry. In general, feed harvested by grazing animals supports livestock at the lowest average cost, hay and grass silage at somewhat greater costs, and grains at the highest cost per unit of total digestible nutrients utilized by livestock. It is the considered opinion of many animal nutritionists that, due to the economic squeeze, even more of the total digestible nutrients required by livestock must come from grazing lands.

Grazing lands occupy 2.5 to 3 times as much land as the grand total for all crops harvested by machinery or by human labor. For more than 20 years this nation has been developing a program of soil and water conservation in which grasslands play an important role.

Without authoritative data on grazing land production, it is difficult to reach decisions on the proportion of federal and state appropriations that should be devoted to the needs of forage production. Moreover, the administration of research, extension, and teaching has no firm basis for seeking balanced treatment of grazing lands as compared to other crops —and indeed to the other commodities (recreation, watershed, urban development)—and of the feed component in livestock enterprises.

Eight thousand years is not a long time in the history of the earth, but as recently as that, man began to domesticate animals and plants. And as recently as that the whole world was wilderness. The myth that primitive man was in harmony with his environment has been shattered. A careful study of man's history from the last Ice Age to the present reveals the fact that man has progressed by modifying his environment. As I have said, the ability to do so is one of the significant differences between man and other animals. During the last 10,000 years man has been in turn a collector and hunter, a cultivator and domesticator, and finally an industrial agriculturist. The transition has been a slow, laborious process.

*From paper presented at First Intermountain Meadow and Range Fertilization Conference, Ft. Collins, Colo., Feb. 19, 1960.

TABLE 1. Annual Agricultural Income in the Seven Western States*

State—	Total Annual Farm Income (thousands)	Income from Livestock (thousands)	Numbers of Head (thousands) Cattle	Sheep
Arizona	$ 435,582	$ 163,782	943	443
California	2,829,463	1,088,708	3,738	1,866
Idaho	403,843	190,818	1,360	1,109
Nevada	52,658	46,372	585	434
Oregon	400,567	190,295	1,412	881
Utah	161,285	127,879	706	1,354
Washington	573,028	219,166	1,111	274
Totals	$4,856,426	$2,026,938	9,855	6,361

*Source: Western Livestock Journal, January, 1960.

Let me recall what must have been involved in the domestication of plants. Early man took wild plants, or their fruits and seeds, from their natural environments and provided different environments nearer home. Or he attempted to modify conditions where the plants were growing wild. He found over the centuries that differences in climate were very effective in limiting the distribution of some plants, but less effective with others. Some soils were infertile. Some plants thrived on a variety of soils, whereas others survived on only one soil. Some crops were easier to harvest than others. Certainly there were many limiting factors to overcome.

In spite of ignorance, superstition, and untold difficulties, man gradually developed an efficient agriculture. As he gained experience in animal and field husbandry he became increasingly aware that he was dealing with the inter-relations of climate, soils, plants, and harvesting operations. We may define agriculture in the broad sense, therefore, as man's attempts to overcome the limitations of nature in order to raise and harvest a desired crop.

We can safely say that the degree of success attained in overcoming these limitations is almost directly proportional to the effort expended in growing and harvesting the crop. And this applies to research perhaps even more than it does to practical husbandry.

The history of the West has repeated in essence the history of early man's attempts to modify the environment to suit his needs. Grazing was the rule on the best lands first. As population increased grain cropping developed, with its protective fences. The livestock were forced onto the poorer lands. Where irrigation practices made possible the development of orchards, vineyards, and other intensively farmed crops, the grain moved up on the terraces or on poorer land and the livestock were pushed into the hills. Today our rich valley lands support more and more subdivisions, factories, homes, and freeways. Irrigated agriculture is moving to poorer uplands. Grain is grown higher in the hills.

Livestock have again been forced to poorer and higher land. And population pressure is challenging our ranges and wildland-use patterns. There is strong demand to withdraw these for recreation use. In spite of their production under less favorable natural conditions, farm yields have increased over the years. The farmer has had to overcome more and more limitations of nature to do this.

Research accounts in large measure for his success—research on cultural practices, improvement of varieties, fertilization, and on harvesting methods. Until recently, the attention of those concerned with the use of rural land has been focused primarily on the cropland areas. There, the remarkable productivity of the land and the intensity with which it has been farmed have combined to produce an agricultural economy of a stature unmatched elsewhere in the world.

But these very achievements in intensive agriculture have tended to obscure both the importance of the uncultivated lands and the significance for all of us of their timber, watershed, grazing and recreational potential. Now, with the increasing pressures of a rapidly growing population being evidenced throughout the upland areas, these largely undeveloped lands require much closer study than they have yet received. A distinctive feature of the uplands is that large areas are subject to multiple uses: a given area of land may serve for timber production, watershed, recreation, and wildlife habitat, as well as for grazing by domestic livestock. These multiple use characteristics must be taken into account in any evaluation of these areas.

Wild land recreation is defined as any leisure activity utilizing the lands, streams, lakes, reservoirs, and transportation routes away from urban or agricultural developments. It would include such activities as picnicking, camping, hiking, hunting, resort vacationing, winter sports, organization camping, swimming, boating, fishing, auto sightseeing, and horseback or airplane traveling into wild country. Participation in "mass" leisure in highly developed areas, whose primary attraction may be the wild surroundings, as well as solitary travel in wilderness regions must be categorized as forms of recreation.

It should be emphasized that such activities are performed not only on publicly owned lands, but to an increasing extent, on hundreds of thousands of private ownerships. Recreational use of grazing lands has accelerated at a greater rate than any other activity. These recreational activities are impinging everywhere on long established land use practices. Dollar returns from limited areas of recreation use are exceeding any previous commodity production value in these areas. If grazing lands are to provide maximum benefits to an enlarging population, a great deal more information is needed on the livestock use of these areas so that in land use research and management planning an intelligent developmental program may be attempted.

The grazing lands constitute the major water yield areas of the nation. These areas produce a mean annual runoff estimated to amount to 500 million acre feet. Highly urbanized developments at the foot of many of the mountain ranges make it imperative that such grazing lands be subjected to much more intensive management than has been possible in the past. These areas also contribute important economic benefits because of the strategic location of the water they produce.

The increase in number of people is complicating the problems of land management in much the same degree that it has affected education, transportation and other areas of major concern. Only a few examples of the increasing pressure of population on grazing lands will be mentioned to illustrate the point. Residential use of wild land areas is increasing rapidly. Apart from the reduction in land area available for various other productive purposes, such residential use has served to increase greatly the critical problems of grazing land fire protection. It has raised substantially the property values at stake; it has added much greater hazards to human life; it has materially increased the likelihood of fire on grazing lands.

Small tract development is also complicating water rights, grazing use, and other aspects of wild land management. Continued increase in such use is indicated for the future. But facilities for handling increasing numbers of people have not kept pace with the demand.

NEW OFFICERS of the Plant Food Educational Society of New Jersey are: (seated, left to right) Jim Carroll, Chamberlain & Barclay, vice president; Stacey Randle, New Jersey Agricultural Experiment Station, secretary; Graham Campbell, Independent Manufacturing Co., president; Charles A. LuBow, Star Fish & Bone Fertilizer Co., treasurer, and Jack Dantinne, Baugh & Sons Co. Standing (left to right) are Jack Litzelman, GLF Soil Building Service; Bob Lenhart, Potash Company of America; William Reid, American Cyanamid Co.; Howard Stark, Limestone Products Corporation of America, and Ken Hall, Nitrogen Division. Not pictured is Jack Satterthwaite, Reed & Perrine.

Apart from overcrowding and inconvenience to the users, more fundamental problems have arisen.

How can more intensive use of vital areas be accommodated without destroying the attractive character of the areas? How can the recreational use of grazing lands be integrated with other essential use such as watershed management and timber production? How can the increasing costs of recreational developments be paid in the face of both a tradition of free recreational use and in increasingly severe competition for public funds?

That more intensive use of grazing lands can contribute substantially to the future national economy is apparent. There are soils and topographical features of the grassland, woodland-grass, and brushland-grass areas that are amenable to greatly increased forage production. We know, for example, that on certain soils and sites current meat production is less than one-third of the potential and on others, particularly some of the brush areas, it is a very small percentage of the potential.

Recognition of the multiple use concept augments the need for intensified research programs. Both domestic stock and some forms of wildlife are dependent on the forage and browse resources. People are making greater use of these same lands for recreation purposes. Research scientists have an obligation to show the way to increase economic use of this grazing land resource. (The foregoing statement is taken from an inter-society report on the need for census of our grasslands.)

Let us look at a cross-section of agricultural crops. Compare the natural vegetation found in the desert with a date palm orchard planted there. To grow date palms successfully, man had to learn to overcome the limitations of lack of water, infertile soil and, particularly, difficulties of harvesting. Think of the bunchgrass association that once existed in the Sacramento Valley of California, and compare it with a highly productive rice field. A great deal had to be learned about the limitations of nature and how to overcome them by the controlled use of water, proper fertilization, improved plant varieties, and specialized harvesting equipment.

All of the problems are not yet solved, but new helpful techniques are continually being brought to light by constant research. There are now thousands of acres of irrigated pastures in the arid regions of the world. This has been made possible through the use of improved varieties of grasses and legumes, improved soil fertility, water control, and regulated livestock grazing—all developments that have overcome nature's limitations.

Millions of acres of dryland pastures now exist on what was once relatively, if not absolutely, unproductive range and wild land. For example, there are more than 11 million acres of highly productive sub-clover pasture in the "well watered" (15 inches or more annual rainfall) region of southern Australia alone. Phosphate and clover have done wonders to some of New Zealand's rough range country. This is true for thousands of acres of California's foothills. But on most of the range and wild lands, livestock must still search for forage as Mesolithic man searched for food.

I have attempted to illustrate the diversity of agriculture and man's degree of success in overcoming the limitations of nature in order to raise and harvest the desired crop. There was considerable variation in the degree of success in learning to handle the many and diverse crops. Indeed, that degree of success varies from crop to crop even today, as we very well know. But gradually, over the last 8,000 years, man has progressed with many crops.

Ten thousand years ago he roamed about collecting the fruits and nuts of trees and shrubs and vines, and the seed of grasses. Now he has orchards and vineyards, and fields of improved varieties of wheat, oats and barley. His animals used to forage in the hills for existence. Now, in favored places, they too profit from man's intensive agriculture—irrigated pastures, corn, sorghums, alfalfa, hay, silage and the like. But on the range and wild lands of the world today there has been little change in the past thousands of years.

Let me give you a few examples of what has been accomplished on certain soils and sites:

First, increased production on grasslands. (a) Nitrogenous fertilizer provides earlier feed in the beginning of the growing season. Compare 240 lb. of dry matter an acre with ten times that amount at the same date. And it provides more total production for the season. Compare 6,000 lb. of dry matter at end of the season with less than half that amount.

(b) Use of introduced annual clovers, phosphorus, and intensive livestock use on a selected site at the Hopland Field Station. Compare 979 sheep-days an acre on this improved area with 82 days an acre on the station as a whole. Of course all sites cannot be so improved, but it will well repay the farmer to spend his time and money on smaller selected sites. This will help the entire range by reducing the livestock load on certain critical areas.

Second, increased production on brushlands. (a) Nitrogen, plus sulfur, on converted sagebrush range in northeastern California. Yield on check plots varied from 86 to 966 lb. an acre in a 3-year period. These were doubled by fertilization and the sulfur lengthened the green feed period. (b) Complete treatment following a wild fire in San Diego County—seeding, herbicides, fertilization, intensive livestock use.

Note, I referred to "certain soils and sites." We don't know enough about "Other soils and sites," When we do we can go farther. The soil is one key, vegetation another. Learn how to fertilize soils that now have worthless vegetation and you can help meet the challenge of these range areas.

It is time we took a positive approach toward solving our problems. Experience over the past 50 years surely tells us the custodial approach is not the answer. The emphasis must be changed from management to improvement. We want more forage and better browse; we want watershed protection through soil and water conservation, and we want a reduction of losses from wild fire. The problem is the same for all: to replace relatively undesirable populations of plants with more desirable forage and ground cover capabilities and which are less highly flammable. The public must be made aware of the possibilities of fire prevention compared with the costs of so-called fire protection.

I am firmly convinced that man's agricultural development points the way to solving the problems of our forests, ranges, wild lands, watersheds, and wilderness areas. Certainly, these are interwoven geographically and if we want a forest, a range or a wilderness we must work for it as a farmer does for a cotton field or a rice crop. Man can improve on nature in wild lands just as he has on his more easily tamed farm land. He must do so to meet the food demands, the timber demands, the water demands, and the recreation demands of an increasing population.

Man has assumed wrongly for hundreds of years that natural vegetation on range and wild land areas was best. He has not only been content with them as provided by nature, he has also believed they must be maintained in their natural state. In past thousands of years, man has developed the tools and knowledge necessary to grow bigger and better agricultural crops. But over the same thousands of years, on the rangelands and wildlands of the world there has been little change.

It is urgent that the agricultural scientist participate in research on watersheds, wilderness areas, and ranges. These are renewable resources, and facing the researcher and administrator is the problem of developing research and management programs that will insure not only the continuity, but also the improvement of these natural resources.

Borers Set Record

NEWARK, DEL.—Corn borers hit an all-time high in Delaware last year with 3.94 borers per stalk, according to the department of entomology at the University of Delaware.

Arkansas Farmers Use Record Fertilizer Amount

LITTLE ROCK, ARK.—Arkansas farmers used a record amount of commercial fertilizer in fiscal 1958-59, the Agricultural Extension Service reports.

Officials said a total of 135,947 tons of plant food material was used—an increase of 23% over the previous fiscal year.

One of the largest increases came in the use of nitrogen, it was noted. Experts said nitrogen usage could have shown an increase of 43% over the previous year if recommended rates were applied to crops and pastures.

Officials attributed the increased fertilizer consumption to an increase in the number of farmers using new and enlarged soil testing facilities.

County agents made 31,663 soil samples and tests for 623,750 acres of land in 1959, it was reported.

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

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PESTICIDE SITUATION

(Continued from page 1)

quirement for this raw material used in the manufacture of synthetic organic pesticidal chemicals such as DDT, benzene hexachloride and 2,4-D amounts possibly to 35,000,000 gal. A figure for the 1959 production of all synthetic pesticidal chemicals will not be available for several weeks. However, it will probably be higher than in 1958 when 539,396,000 lb. were produced, and possibly close to the 1956 record of 569,927,000 lb.

Production of synthetic organic pesticidal chemicals in 1958 had a value of $239,390,000, calculated from unit sales values as reported by the U.S. Tariff Commission. Insecticides comprised about 53%, herbicides 26% and fungicides together with soil fumigants 21%. The relatively small value of synthetic organic rodenticidal chemicals produced cannot be segregated from these figures.

Total production of all pesticidal chemicals and related materials exclusive of dust diluents, solvents and surface-active agents amounts to approximately 1,000,000,000 lb. annually. This figure includes ground sulfur for dusting and spraying, as well as other inorganic chemicals (arsenical and copper compounds, sodium chlorate, borates, etc.).

Finished pesticidal preparations containing these chemicals probably amount to three billion pounds (1,500,000 tons). Primary manufacturers' sales of all pesticidal chemicals advanced about 5% during 1959. Translated into cost to consumers, the total sales value at the users' level would be 550 to 660 million dollars. The 1959 gain in sales occurred without the stimulus of any spectacular outbreak of insect pests or plant diseases.

The dollar value of U.S. exports of pesticides, although up 4.7% in 1959 over the previous year, was slightly under the record attained in 1957 (Table 3).

Over the last four years exports appear to have levelled off at about $84,000,000 worth. World health programs will tend to maintain this level or raise it somewhat. Exports of benzene hexachloride, 75% DDT and organic phosphorus insecticides in 1959 were notably greater than in 1958. A number of other pesticides (especially copper sulfate and technical DDT) were exported in considerably smaller quantities. Volume of pesticide exports is shown by commodity classifications in Table 4.

Total carryover from the 1959 season by primary manufacturers and formulators of pesticides was at about the same level as on Sept. 30, 1958, according to figures obtained in the annual inventory survey conducted by the U.S. Department of Agriculture in cooperation with the National Agricultural Chemicals Assn. (Table 5).

Stocks of primary chemicals in the possession of their producers averaged 12% lower than at the end of the previous year. Primary producers, some of whom are also formulators, reported 63.4% of all stocks. Of all carryover reported, whether possessed by primary manufacturers or mixers, formulations comprised 36.2%.

Domestic disappearance for some major pesticides is essentially the same as U.S. consumption (Table 6).

It is calculated by adding the carryover figure for the previous season to the production for the crop year, then deducting exports and end-of-season stocks. Such disappearance values, however, differ from actual consumption by the amount of annual change in end-of-season carryover of material in the distribution "pipeline."

The usual survey of aerial application of pesticides was not made by the Civil Aeronautics Administration for 1958. A survey for 1959 is underway and results will be available later this year.

Wholesale price quotations of pesticidal chemicals for the four-year period 1956-59 are shown in Table 7.

Of the 16 materials listed, nine were lower, one showed no change, and six were higher in price in 1959 than in 1956. Prices of finished pesticidal preparations ready for use by growers are dependent not only on the cost of the primary ingredient, but also on costs of solvents, emulsifiers, dust diluents and other additives, plus containers and labor, transportation, and other marketing services.

Hence, lower prices of primary chemicals do not necessarily result in lower prices of finished preparations. However, competition in the pesticide trade has forced appreciable reductions during the last several years, despite increased manufacturing costs.

Insect infestations were normal generally throughout the country during the 1959 growing season, a rather unusual situation. Despite this fact sales of pesticides were definitely higher compared to 1958. The increase was due largely to the use of more soil insecticides, miticides, preemergence herbicides and nematocides—types which are being applied profitably by an increasing number of growers.

In 1959 grasshoppers were not nearly the problem they were the previous year. In 1958 an area of 4,338,329 acres of range, roadside, and waste land was treated in the cooperative federal-state grasshopper control program, while only 766,478 acres required attention this past season.

The spread of the European corn borer was much more limited during 1959 than the year before. The fall abundance survey showed that populations of this insect were generally lower in the central part of the nation. In the eastern states they were generally higher than in 1958.

Under the cooperative federal-state program to eradicate the gypsy moth an area of 105,651 acres was treated during the 1959 fiscal year. An additional 44,770 acres were treated within the generally infested region under other control programs. The total of 150,421 acres compares with 534,576 acres treated in 1958 and 3 to 4 million acres in 1957.

Localized treatments for the control of the imported fire ant in the southern states have been made over an area of 1,381,534 acres from the beginning of the program through June 30, 1959. Of this area 931,981 acres were treated during the 1959 fiscal year. Applications are being made under a cooperatively financed

(Turn to PESTICIDE SITUATION, page 30)

TABLE 3. Value of U.S. Exports of Pesticides

Year	Value Dollars	Year	Value Dollars
1950	33,252,777	1955	78,980,145
1951	64,820,822	1956	81,855,888
1952	69,436,370	1957	86,002,270
1953	49,062,083	1958	82,066,834
1954	62,957,445	1959	85,938,859

Source: Derived from data published by the Bureau of the Census.

TABLE 8. Pesticides Applied in U.S. Forest Service Programs, 1959

Pesticide	Pounds
Ethylene dibromide	950,000
Benzene hexachloride	500,000
DDT	179,000
Lindane	5,000
Malathion	2,000
Sevin	380
Chlordane	2,400
2,4-D and 2,4,5-T (as acids)	8,000

TABLE 2. U.S. Production of Some Pesticidal Chemicals by Crop Years, 1956-57 to 1958-59

Chemical	1956-57 1,000 lb.	1957-58 1,000 lb.	1958-59 1,000 lb.
Aldrin, chlordane, dieldrin, endrin, heptachlor, and toxaphene (combined production)	73,914	88,879	91,970
Benzene hexachloride (gamma equivalent)	9,376*	6,458†	4,576
Copper sulfate	143,592	98,424	88,264
2,4-D (acid)	32,258	32,525†	26,123
DDT	129,730	131,862	156,150
2,4,5-T (acid)	5,812‡	4,000†	5,500

* Without lindane.
† Estimate based on incomplete data.
‡ Revised.

TABLE 4. U.S. Exports of Pesticides by Calendar Years

Material	1958 1,000 lb.	1959 1,000 lb.	1959 $1,000
Benzene hexachloride (gamma basis, 6% plus)	1,538	2,427	2,081
Calcium arsenate	1,274	123	12
Copper sulfate (normal and basic)	14,495	5,343	675
2,4-D and 2,4,5-T (acid basis)	6,788	5,760	2,666
DDT, technical	25,292	13,242	2,892
DDT (20-74%, 100% basis)	4,701	3,248	1,315
DDT (75% plus, 100% basis)	40,118	58,497	19,325
Disinfectants, household and industrial	9,070	10,005	4,109
Fumigants	4,184	3,678	1,065
Fungicides, n.e.c.	15,127	14,664	8,035
Herbicides, n.e.c.	11,651	8,261	4,050
Lead arsenate	2,100	1,399	276
Nicotine sulfate (40% basis)	62	7	9
Organic phosphorus insecticides (15% plus)	6,383	13,380	7,980
Paradichlorobenzene	2,870	2,981	366
Polychlor insecticides (15% plus)*	53,502	49,459	16,049
Pyrethrum extract	56	70	224
Sulfur, agricultural, n.e.c.	9,246	6,812	268
Agricultural insecticides, n.e.c.	77,706	50,677	8,466
Household and industrial pesticides, n.e.c.	18,212	18,098	6,040
Total	†	†	85,921

* Includes aldrin, chlordane, DDD, dieldrin, endrin, heptachlor, methoxychlor, toxaphene and related chemicals and mixtures thereof.
† No total weight given because BHC is reported only in terms of the gamma content, DDT as 100% technical, and 2,4-D and 2,4,5-T on the acid basis.
Source of export figures: U.S. Bureau of the Census Report No. FT 410, Part II, codes 82001-82280.

TABLE 5. Manufacturers' Stocks of Pesticides (Technical Basis), Sept. 30, 1959*

Material	All stocks: Technical and mixed 1,000 lb.	All stocks: Percentage mixed	Primary producers' stocks: Technical 1,000 lb.	Primary producers' stocks: percentage of 1958†
Aldrin, chlordane, dieldrin, endrin, heptachlor, toxaphene	39,615	32.5	29,639	128
BHC, including lindane				
Gross basis	21,970	26.3	11,217	66
Gamma basis‡	(4,794)	30.1	(2,098)	56
Calcium arsenate	5,258	21.4	4,850	63
Copper fungicides n.e.c.	14,175	9.1	11,527	86
2,4-D (acid basis)	13,395	42.6	11,374	46
DDT	29,628	36.3	14,192	108
Fumigants, grain and soil	34,572		26,348	
Lead arsenate	4,414	27.5	3,379	129
Miticides, miscellaneous	2,620	59.4	1,257	95
Organic phosphorus compounds	10,259	41.9	4,593	80
Sulfur, ground	29,486	46.0	6,233	76
2,4,5-T (acid basis)	4,295	49.8	3,728	86
Other fungicides	12,922	47.8	7,545	121
Other insecticides	8,008	40.9	4,473	98
Other weed killers	17,017	49.3	14,283	156
Miscellaneous, including rodenticides	2,322	14.7	1,800	87
Total	249,956	36.2	158,438	88

* Results of survey by U.S. Department of Agriculture in cooperation with the National Agricultural Chemicals Association, final report.
† Based on goods in the possession of their primary manufacturer; i.e., DDT stocks of DDT producers.
‡ BHC (gamma basis) omitted from totals to avoid duplication.

TABLE 6. Domestic Disappearance of Some Major Pesticides for the Crop Year 1958-59*

Pesticide	Stocks† Sept. 30, 1958 1,000 lb.	Production 1958-59 1,000 lb.	Exports 1958-59 1,000 lb.	Stocks† Sept. 30, 1959 1,000 lb.	Disappearance 1958-59 1,000 lb.
Aldrin, chlordane, dieldrin, endrin heptachlor and toxaphene (combined)‡	23,208	91,970	12,208	29,639	73,331
Benzene hexachloride§	3,727	4,576	1,929	2,098	4,276
Calcium arsenate	7,700	n.a.	583	4,850	n.a.
Copper sulfate¶	8,128	88,264	6,554	5,608	84,230
2,4-D (acid equivalent)	26,566	26,123	5,213**	11,374	34,102
DDT	13,093	156,150	74,369	14,192	78,682
Lead arsenate	2,611	n.a.	1,996	3,379	n.a.
2,4,5-T (acid equivalent)	4,315	5,500	579**	3,728	5,588

* Based on available information; crop year is from Oct. 1 to the following Sept. 30.
† Stocks of primary producers only; for 2,4-D and 2,4,5-T, formulated goods in possession of primary producers included also.
‡ Not corrected for exports below producers' level.
§ Gamma isomer basis; includes lindane.
¶ Disappearance at primary producers' level for all domestic uses including industrial.
** Assumed exports of 2,4,5-T to be one-tenth of combined exports of 2,4-D and 2,4,5-T.
n.a.—Figure not available.
Sources: (Stocks) Survey by Department of Agriculture (except copper sulfate by Bureau of Mines). (Production) Tariff Commission; Bureau of the Census; chemical industry. (Exports) Bureau of the Census.

TABLE 7. Average Weekly Quotations of Wholesale Prices Per Pound of Certain Pesticidal Materials*

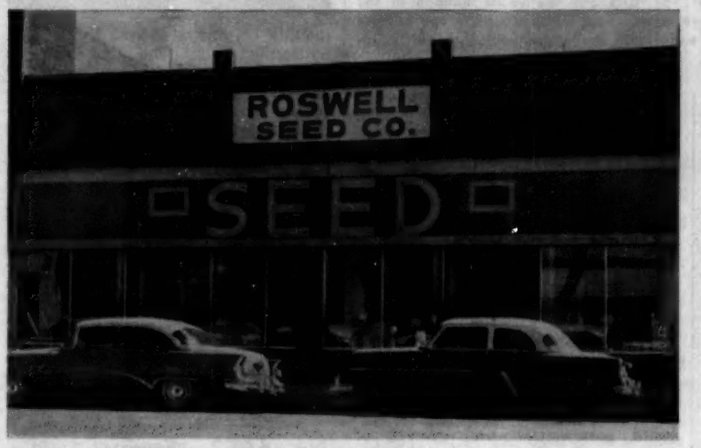
Materials	Calendar Year: 1956 Dollars	1957 Dollars	1958 Dollars	1959 Dollars
Aldrin	.880	.892	.930	.955
Calcium arsenate	.093	.092	.089	.091
Chlordane	.650	.650	.650	.650
Copper sulfate	.154	.124	.110	.122
Cube (root)	.287	.290	.270	.245
2,4-D	.375	.385	.400	.400
DDT	.252	.226	.218	.230
Dieldrin	1.800	1.800	1.821	1.850
Endrin	3.750	3.750	3.555	3.395
Lead arsenate	.275	.275	.273	.293
Lindane	2.973	2.950	2.908	2.400
Malathion	.900	.900	.894	.890
Parathion	1.340	1.343	1.270	.840
Pyrethrum (1.3% grade)	.650	.650	.650	.650
2,4,5-T	1.100	1.100	1.100	1.100
Toxaphene	.286	.219	.220	.220

* Calculated from price quotations in the Oil, Paint, and Drug Reporter.

SPECIAL MERCHANDISING SECTION

BETTER SELLING

MARKETING NEWS AND FEATURES



A FARM STORE is operated in the front of this building, while the seed cleaning and sprayer equipment is kept in the back. The firm is the Roswell Seed Co., Roswell, N.M.

VERDI GILL (on forklift) and Ivan Gill (on sprayer), two of the owners of the Roswell Seed Co., Roswell, N.M., show two of the firm's main items.

Chemical Sideline Thrives For New Mexico Firm

Adding farm chemicals to a thriving seed business was a profitable move for the Roswell Seed Co. of Roswell, N.M. For only a small outlay in equipment and cash, the owners soon established themselves as farm chemical specialists, both in sales and services.

"Insects here in the Pecos River Valley have always been plentiful, it seems," said Verdi Gill, who with his brothers Walter and Ivan own the business. "The spotted alfalfa aphid has been particularly costly to farmers, and many of them wanted help from dealers. This, as much as anything else, caused us to add a complete line of insecticides and sprayers."

The store does not sell fertilizer, but handles all types of insecticides, fumigants, sterilants and spraying equipment.

"Handling applicators is a natural follow-up for insecticides," he said. "So we got a dealership for the John Bean sprayers and also for the Hahn Hi-Boy. These items have sold quite well, and partly because we push them. When we talk with a farmer about insect control, we mention our line of sprayers. If he comes to the store, we take him out back and show him the different types, even though he may not be in the market right then. If he grows alfalfa or cotton, he will need one sometime, so we want him to remember us."

In 1959 the three brothers sold seven of the Hi-Boys. In addition, they sold a large number of John Bean sprayers and numerous parts.

"To handle sprayers or any type of applicators, a dealer should keep a large stock of parts," said Verdi Gill. "This way he can keep the sprayers going for several years, and probably get all that farmer's business. Also a repair shop, as we have, is a good investment."

The firm has found that field trips pay off handsomely, because this enables the owners to learn crop conditions and become acquainted with farmers. Many times a casual field inspection will reveal a build-up of spotted alfalfa aphids or some cotton insect. If there are signs of damaging insects, the brothers try to know it several days in advance then warn farmers by personal visits and through the store's advertising.

"We really started the farm chemical department as a sideline to our regular seed business," Mr. Gill explained. "We buy and process seed from a wide area, then sell it under our brand name to farmers all over eastern New Mexico.

"When we help a farmer stop an aphid invasion, we help everyone. He makes a better crop and more money. We sell him the insecticides and then can buy better seed when he harvests the crop."

The Roswell Seed Co. has made a study of various chemicals in order to advise farmers accurately. They know there is a vast misunderstand-

(Turn to SIDELINE, page 14)

Service-Mindedness Most Important for Dealers

By EINAR JOHNSON
Deputy Regional Director
Small Business Administration
Chicago, Illinois

"I serve my customers," the store owner said, "and that means more than selling them goods."

That store owner was expressing a creed which is all too often disregarded by some of the nation's small firms; and yet "service-mindedness" may create larger profits and greater prestige, while its absence may hamper your store in the competitive world of retail commerce.

● **The Willingness to Serve.** The owner's, therefore the store's, quality of service, is a highly significant factor in a small firm's fight for trade. The willingness to give personalized service is one of the best assets of a small business in its competition against big organizations. Looking at it that way, there is every reason why you should put the idea of service high on the list of objectives to be attained.

A willingness to serve can be a trump card for a small store: The owner of a big establishment can hardly render the personalized service you can offer, nor can he become as intimately acquainted with his customers as you can.

Service-Mindedness An Attitude of Mind

You may ask: What is service-mindedness? Or, again: Haven't I always been service-minded? The answer to the second question may well be Yes. You probably have given your customers good service. But possibly there are some areas of service-mindedness you have overlooked. And that leads to the second question, which this article will try to answer, at least in part.

● **Questions and Answers.** Chances are that if you asked a dozen of your friends in retailing what they meant by service, you'd get a dozen different answers. So there appears to be no one answer to it. One of your friends may think of service as the simple act of selling; another may have a broader definition and tell you that service in his mind connotes the entire function of his business including merchandising, selling, billing, customer relations and general store policy; a third may go further yet and tell you that service is the fulfilment of a need—that, in order for a small business to justify its existence, it must fulfil a need, want or desire on the part of people who live in or have access to the area where his shop is located. Basically, all of these answers are probably correct, because service means many things.

Unquestionably, you as a small retailer have some handicaps: Your working capital is more limited than that of the big company, and so is your space. But handicaps in one field can be neutralized by assets in another, and here is where the willingness to serve comes to your aid. If you are indeed willing to serve—and if you are an aggressive manager—you have made yourself thoroughly familiar with the needs of your community or trading area. These needs may change from time to time. For instance, suddenly there may be a big, unexpected demand for an out-of-season item; so you increase your stock in that line, cutting back on another line. That is part of service-mindedness. You know best when people in your area like to shop; so you adjust your store hours to their wishes. That, too, is part of service-mindedness. What else is service-mindedness? Let's see.

● **Two Stores—Two Attitudes.** Mrs. Fred Thompson, a housewife, recently drove up in front of a small hand laundry to pick up her husband's shirts. Hardly had her car stopped when a small boy came running over to her. "I'll be glad to bring your laundry," he announced cheerily, "if you'll let me have your ticket." Mrs. Thompson liked that extra service, just as she had liked the attitude of the young woman behind the counter who waited on her during a previous visit to that laundry. On that occasion the young woman had taken a careful look at the shirts. "The Ox-

(Turn to SERVICE, page 11)

SUMMARY

To serve means more than selling; to be service-minded means more than waiting on customers.

Service-mindedness, in a commercial world where small business faces heavy competition from its own ranks and from bigger, richer organizations, is a factor that no owner-manager can afford to overlook. It is a broad term, including within it the act of selling, the art of dealing with customers, the general store policy. Most importantly, its greatest significance lies in the fulfilment of a commercial need on the part of the consumer. From a strictly business point of view it may lead you, on one hand, to specialize or, on the other hand, to diversify in your operation.

To be service-minded means that you, the small firm owner-manager, always keep in mind the customer's wishes, desires, needs. It means that every one of your policies is customer-oriented. But it also means that you can probably expect your business profits and prestige to increase. For customers old and new are likely to respond to service-mindedness. This article appears through the cooperation of the Small Business Administration.

WHAT'S NEW
IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 6057—Fork Lift Booklet

The Model 590 Towmotor fork lift truck called the "Naro-Aisle-Stack" is described in an 18-page booklet released by Towmotor Corp. Illustrated are the truck's 180° pivoting action, plus its control features and com-

ponents. A typical space-saving situation, where 16 extra rows of storage space is gained, is covered, the company says. A method of power application for fork lift trucks, based on a principle of hydrostatics, is covered in detail. For copies, check No. 6057 on the coupon and mail.

No. 6058—Insecticide Folder

Pennsalt Chemicals Corp. announces the availability of a folder entitled "Control Aphids on Non-bearing Fruit Trees, Nursery Stock and Ornamentals." The folder describes Penco Ompa, a water soluble organic phosphate compound which contains 4 lb. octamethyl pyrophosphoramide per gallon for aphid control and mite suppression. How it works, advantages, how it is used and dilution table are included. For copies, check No. 6058 on the coupon and mail.

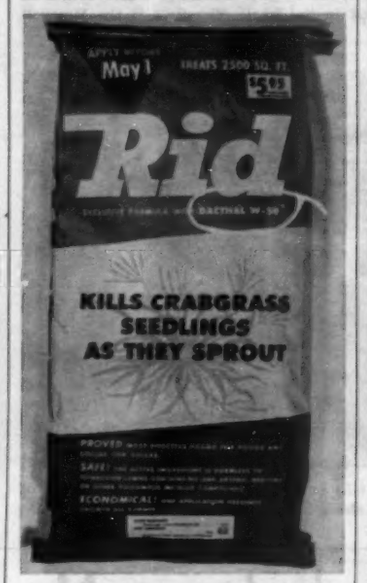
No. 6060—Pallet Loading Machine

A pallet loading machine which permits high speed one-man loading of standard pallets for transporting by fork lift truck, has been announced by the Power-Curve Conveyor Co. The unit's powered turn-table station is used with a standard Power-Curve flexible loader and swivel stacker. Bags are power propelled into position on the pallet with the machine operator guiding each bag, using any palletizing pattern. When one pallet

is loaded, the turntable is rotated to position a new pallet while the loaded pallet is removed by fork lift. More than 1,000 bags an hour can be palletized by one man, the company says. For details, check No. 6060 on the coupon and mail.

No. 6059—Crabgrass Control

Discovery of a herbicide chemical that gives control of crabgrass and other noxious annual weeds, has been announced by Diamond Alkali Co. Called "Dacthal," the chemical dimethyl tetrachloroterephthalate, prevents germination and growth of crabgrass. It is being marketed under



the Swift & Co. brand name of "Rid." For details, check No. 6059 on the coupon and mail.

Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6048—Selective Weed Killer

"Butoxone," a selective weed killer designed to control many broadleaf weeds in alfalfa, red clover, birdsfoot trefoil, alsike and ladino clovers, has been announced by Chipman Chemical Co., Inc. The product contains 2,4-DB and, according to company literature, tests and recent commercial use have proved its weed killing effectiveness without effect on the specified crop. It is a liquid and is applied as a spray in either the seedling or established legumes grown for seed. Complete information can be secured by checking No. 6048 on the coupon and mailing to this publication.

No. 6052—Tractor Mounted Sprayer

Hanson Equipment Co. announces a "Trak-Pak" sprayer unit that

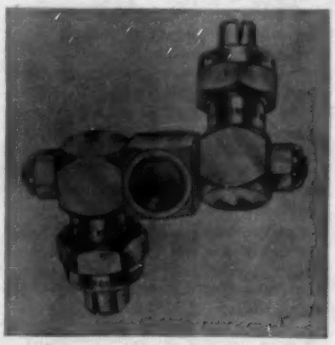
mounts on any standard three-point hydraulic hitch. The unit can be equipped with either a boom or "Brodjet" sprayer. It is available with a choice of piston-type or nylon-roller-type pumps. Chemical particles are kept in suspension by a propeller-type mechanical agitator. A universal joint drive shaft from the tractor PTO powers the pump-agitator assembly. The 100 gal. fiberglass tank is completely inert to all agricultural chemicals and will not rust or corrode, the company says. A 14 in. top opening provides access to the tank interior. Chemical level is always visible on the gallonage gauge molded into the translucent tank wall. For complete information, check No. 6052 on the coupon and mail.

No. 6053—Spray Hose Data

Literature covering the line of agricultural spray hose of the Swan Rubber Co. is available. Types of agricultural spray hose described in the new literature include low pressure, medium pressure, high pressure and hand spray. Information on applications, cover, reinforcement, tube, lengths, packaging and recommended couplings is outlined with each hose illustration. Special reference sections illustrating and describing various agricultural hose couplings plus the company's manufacturing facilities are included. For copies, check No. 6053 on the coupon and mail.

No. 6051—Spray Nozzle

Delavan Manufacturing Co. has announced the development of a new spray nozzle. Called the Delavan BX, the tips are designed to offer additional coverage for spray booms at flow rates consistent with standard boom nozzles. They are available from 5 GPA through 10 GPA. Manufactured as both single and double nozzle, the BX offers additional coverage ranging from 68 in. to 104 in. for single nozzles and from 153 in.



to 194 in. for double nozzles when both are placed at 30 in. boom height, the company says. The single nozzle can be used for boom extensions or roadside spraying. A swivel nozzle mounting is recommended for easier adjustments. The double nozzles are well suited for small broadcast sprayers. For more information, check No. 6051 on the coupon and mail.

No. 6054—Sprayer Brochure

Hahn, Inc., announces the availability of a 16-page brochure and

Send me information on the items marked:

- ☐ No. 6048—Selective Weed Killer
- ☐ No. 6049—Power Sprayer Dispenser
- ☐ No. 6050—Spraying Gauge
- ☐ No. 6051—Spray Nozzle
- ☐ No. 6052—Tractor Mounted Sprayer
- ☐ No. 6053—Spray Hose Data
- ☐ No. 6054—Sprayer Brochure
- ☐ No. 6055—Calendar Promotion
- ☐ No. 6056—Improved Lawn Food
- ☐ No. 6057—Fork Lift Booklet
- ☐ No. 6058—Insecticide Folder
- ☐ No. 6059—Crabgrass Control
- ☐ No. 6060—Pallet Loading Machine

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catalog on its 1960 line of Hi-Boy self-propelled high-clearance sprayers and accessories. The brochure illustrates uses of the sprayers for corn, cotton, tobacco and other crops. For copies, check No. 6054 on the coupon and mail.

No. 6050—Spraying Gauge

A gauge, with direct reading in "gallons per acre" and designed to be mounted on crop spraying units, usually directly behind the tractor or jeep driver, has been announced by Mayrath, Inc. The gauge is for use with either 5 gal. or 8 gal. tips spaced 20 in. apart and gives gallons per acre of insecticide or weed killer being sprayed at speeds of three, four or five miles an hour, the company says. The gauge also shows pounds per square inch pressure, however, in

case the operator wants to use conventional charts. For more information, check No. 6050 on the coupon and mail.

No. 6055—Calendar Promotion

Douglas Chemical Co. announces it has again prepared a two-year, color calendar featuring pictures of the 12 most troublesome bugs with which grain storers have to contend. Ac-

cording to company literature, the calendar was so popular for the 1958-59 period, that it prompted reprinting it for the 1960-61 period. For copies, check No. 6055 on the coupon and mail.

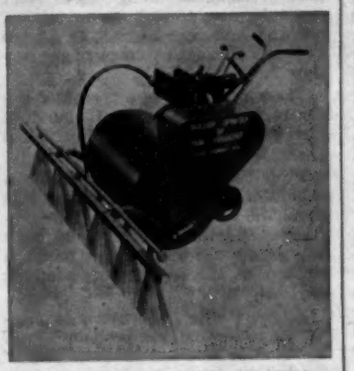
No. 6056—Improved Lawn Food

Swift & Co. announces greater coverage, higher nutrient content, ease of handling and a formula designed for grass in its 1960 line of Golden Vigoro Lawn Food. It is now packed in 35 lb. bags, with a coverage of some 5,000 sq. ft., the company says.

For more information, check No. 6056 on the coupon and mail.

No. 6049—Power Sprayer

A self-propelled power sprayer that applies a consistently even spray pattern aided by nozzles spaced 12 in. apart, has been announced by Sun Industry, Inc. The uses include lawn



weeding, tree spraying, fertilizing, power lawn rolling and general spraying for small orchards. The power driven, 30 gal. roller drum contains the spraying material and acts like a huge wheel transporting the fluid with a minimum of compaction, the company says. Baffling within the drum provides a concrete mixer type of agitation. A 6 ft. boom is recommended for easy maneuvering around trees and shrubbery, but booms up to 13 ft. are available. The pump has a 5 gal. per minute capacity at 150 lb. pressure. For complete information, check No. 6049 on the coupon and mail.

SERVICE

(Continued from page 9)

ford cloth with no starch and a light starch on the broadcloth?" she had suggested. "I am sure you will find our work satisfactory. They'll be ready Saturday."

This little extra in service and courtesy had pleased Mrs. Thompson, who remembered some other experiences which had left her with a far less pleasant impression. There was, for instance, the small independent meat market which advertised hamburger at three pounds for $1. So she went in. What she found was a clean, well lighted place, with new and bright light fixtures, and a wide variety of fine meats displayed in spotlessly clean cases. So far so good.

Mrs. Thompson asked for three pounds of hamburger.

"What else," the butcher asked, tossing the meat on the scale.

"That's all, thank you."

"They sure know a bargain when they see one," the butcher complained to no one in particular. "We got other stuff, too, you know."

As Mrs. Thompson was handing over her dollar bill, she silently promised herself never to return to this store. She never has.

Where the butcher had obviously gone wrong was in trying to compete with a nearby chain store on a price basis alone. Where he just as obviously fell down was in overlooking the fact that price may lure a customer into the store once; but discourtesy will keep him away forever. This lack of a willingness to serve cost him far more than any price paring could possibly bring in in cash.

Service-Mindedness: Fulfilment of a Need

Even if you offer many real services, however, your sales are going to be limited to some extent by the scope and depth of your lines and pricing policy. But a willingness to serve your customers and community is still important, so let's see how you can put that willingness into practice.

● **Specialization and Diversification.** There is no one way to serve. A few examples, however, may be of value to you.

The X Drug Store in a certain midwestern town sells cosmetics, shampoos and dentifrices, but its real claim to fame is its complete line of prescription drugs. No other drug store for miles around can compete with it on that score. In fact, you might call it a "druggists' drugstore," for many other drugstores in the area get their prescription ingredients in X. Doctors, too, are big clients: Many of them recommend that their prescriptions be filled here. This specialization has made that enterprise a success.

On the other hand, the Y Pharmacy, located in an Eastern city, offers a wide variety of goods from banana splits to teddy bears, from prescriptions to perfumes. In this case, diversification, arrived at after a careful survey of customers' wishes, made for commercial success.

● **What Type of Service?** Clearly, willingness to serve was at the bottom of the success of the two enterprises mentioned above. And the success was due to planning. How did the owners arrive at such opposite merchandising policies, both having as their basis the willingness to serve?

Both men instructed their personnel to make a note each time an item was asked for that the store did not carry; in addition, the two staffs also noted the most popular items that were available in the respective stores. Eventually, each owner had a pretty clear idea of what his customers wanted, and he then made the final decision—one to specialize, the other to diversify. Thus, when the owner of X Drug Store realized that doctors and other drugstores were becoming his biggest clients, he decided to specialize in prescriptions, when the owner of the Y Pharmacy became convinced that his customers wanted the store to make variety the hallmark of his enterprise, he knew that he should head for diversification.

Both men and their stores, however, aimed at the same target: rendering the kind of service their customers wanted. That, after all, is the basis of all business. In addition, what both owners did was to fill a "gap" in existing supply and service.

● **The Limits of Service.** No matter how service-minded you are, however, you cannot expect to fill all the gaps and be both diversified and specialized at the same time. As an example of a man who wanted to be all things to all customers, let's consider the case of Bob Brown who owned and operated a hardware store.

Like many a hardware store, Bob's sold some paint. Now, Bob was not in the paint business, and so paint to him was merely an accommodation

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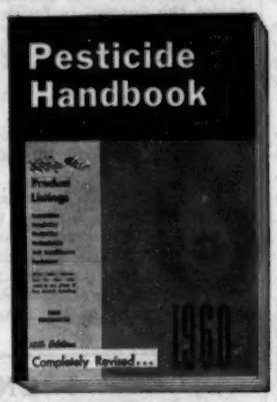

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about the editor—

Dr. Donald E. H. Frear, Editor of PESTICIDE HANDBOOK 1960, is one of the leading authorities on the chemistry of pesticides. He is the author of "Chemistry of Insecticides and Fungicides," the first book dealing with this subject published in the United States. In addition, he has written several other books, including "Chemistry of Insecticides, Fungicides and Herbicides." Dr. Frear is Professor of Agricultural and Biological Chemistry at the Pennsylvania State University.

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line. Yet Bob was upset the day he saw Dick Newburger, one of his old customers, come out of the paint store across the street. And, because Bob and Dick were pretty well acquainted, the former tackled Dick about it the next time the latter came into his store, charging him with "deserting to the competition."

Dick smiled. "Nothing of the sort, Bob," he assured the hardware store owner. "But, after all, you don't carry the kind of paint I needed. So what could I do?"

What Dick could do was exactly what he did do, and what many customers must do—that is, seek certain items in specialty shops. This, if Bob would only understand it, is no reflection on Bob's merchandising policy or his willingness to serve his customers and community. After all, if you're stocked only to provide an occasional can of quick dry enamel you can't expect to cover the house paint business. On the other hand, there is some advantage, of course, to being complete in some lines and yet maintain a basic turnover stock in the balance of the inventory.

Service-Mindedness Service When It's Needed

As a small business owner, you can best justify your organization's existence by providing goods and services not available elsewhere in the community, and you can do this with resulting profit to yourself. Also, you can serve the community by making goods and services available when they are needed.

● **Shaggy Man Story.** By day, Ted Benson was an advertising executive in the city; by night, a resident of Suburbia. Being very busy at his job, he rarely had time for personal matters during the day. Not even haircuts. There was, after all, a barbershop in Suburbia. Every night Ted tried to get away from the office in time to get a haircut; but there was always that last-minute memo he had to write, the last-minute postmortem discussion in the boss' office about that lost advertising contract. By the time he was ready to leave, the downtown barbers were closing. So night after night he hurried to his transportation, mentally helped the driver to speed to his home. Night after night he arrived in time to see the head barber pull down that slightly ragged brown shade on which was painted the ominous word, "Closed."

Ted grew shaggier and shaggier. By the time he came to look like a hermit, he decided to take a vacation. His first vacation day Ted marched off to the Suburbia Barber Shop. He was the only customer. Three barbers were lolling in their chairs reading magazines. Well, Ted looks neat and trim again, but he is wondering when he'll ever have time again to get another haircut.

This story points up at once the opportunities of, and lack of, willingness to serve on the part of some small stores. Ask yourself: Am I open when people need me?

● **Charlie's Alway Open.** In many communities and suburban areas there is the small delicatessen store which sells, in addition to somewhat exotic items, the more common staples such as bread, milk and eggs. Let's collectively call these stores "Charlie's Delicatessen." Now, Charlie's is open when other stores are not. And that's what makes Charlie an important asset to the community, while Charlie's willingness to serve makes his store popular and profitable.

For instance, unlike the barber in the above example, Charlie doesn't close down just when you need him most. He's still open at 9 o'clock, sometimes even later; if you have forgotten a loaf of bread, or if friends suddenly drop in and you need some beer and potato chips, or if you simply crave some special delicacy while watching television, you can run down to the corner and get it at Charlie's.

For some types of stores, early openings, too, may be a good thing. To repeat the hardware store example, many of them open at seven in the morning to serve the building tradesmen who begin their own work at 8 a.m. With the growth of suburban living, the volume of off-hour trading has grown; evening shopping, between the hours of 6 and 9 p.m. has become important to customers and stores alike.

You may ask: But how can I provide that extra service—longer hours—in my small operation? Granted, it's not easy for a small business to do. You can, of course, stagger hours and get extra full-time help to do the job; or you might get part-time help for the additional hours. In any case, your overhead will probably grow; but chances are, so will your profits. And you certainly will have once again proved your willingness to serve.

Service-Mindedness Merchandise and Know-How

Frequently you hear people say, "X store carries a good line." What do they mean by "good"?: High-priced goods, the best-wearing merchandise, the best-performing goods? Perhaps what they really mean is this: The merchandise the store carries is the type of merchandise that is right for the area, it is useful, and it is in the right price category.

● **Sales Aren't Everything.** Goods are not made for selling alone; goods are made to be used. An apartment dweller may find a 12 oz. hammer costing 69 cents more useful than a 16 oz. carpenter's hammer costing $3.50. Lesson: Whether you're dealing with apartment dwellers or carpenters, be sure to sell what they need, not what you want to sell. Of course, sales are important to you; but service to your customers means that you should think a great deal in terms of their needs, not just in terms of your sales. And you will perform an extra service if you not only sell merchandise, but also can and do tell your customers how, when, and where to use it.

● **Arnie's Sales Technique.** Take the case of Arnie, for instance. He runs a meat market in a residential community where there is a barbecue grill in nearly every backyard. Every week-end during the summer he features meats for outdoor cooking. But he not only sells the meat, he also tells novice outdoor chefs how to prepare it. In addition, he has recipes which he hands out gratis, and books which customers can look at in the store.

There is a chain store just across the street from Arnie. It, too, sells meats for outdoor cooking, and sometimes makes a special feature of it. Does that worry Arnie? Not at all. People like the little extra services that come with his sales, and so they buy from him.

● **Competing with Mr. Big.** Service-mindedness is, after all, your best line of defense in the perpetual competition with bigger establishments. The big firms give service, too. They usually carry a wider variety of merchandise, their prices are highly competitive, they have parking lots and delivery, are set up to make alterations, very often have air conditioning, and their advertising and display artfully lure the cash-carrying customer. They make it easy—and at times irresistible—to buy from them.

As a small store owner you can't match all these services. But you can match—you can even outmatch—the big store's service-mindedness. How? By giving more personalized service than they are able to offer. This is the true strength of your competitive position; this is a true source of strength of small business.

Texas Area Dealers Stock, Then Sell Fertilizer; Result Is Record Volume

LAMESA, TEXAS — Irrigation farmers of this area put out more fertilizer this past winter than ever before, according to a survey of local dealers. At one time most fertilizer was applied just before planting or as sidedressing.

This change was brought about by dealers who began to sell fertilizer instead of merely stocking it. They pointed out the advantages of early fertilization, held meetings and gave demonstrations.

"I believe there was twice as much fertilizer put out this winter and early spring as last year," said John Rabb, manager of Red Barn Chemicals, "and we'll likely have more sidedressing, too."

One reason for the increase has been the availability of rental units. At least three dealers are now renting applicators and doing custom work.

"Farmers may talk about fertilizing their fields," said Mr. Rabb, "but unless some dealer does a bit of urging, they will seldom put on the proper amount. Some are also reluctant to buy spreaders, but can be sold on rental units or custom application. The rapid increase in fertilizer usage here was brought about by dealers who adopted aggressive selling methods."

'Low Prices Won't Cause Farmers to Up Production'

ITHACA, N.Y. — "The population explosion won't solve the farm surplus problem, declining prices don't cause farmers to step up production, and the American marketing system isn't the efficient machine many persons think it is."

These opinions were presented recently by Prof. G. W. Hedlund of Cornell University in a Farm and Home Week address.

Prof. Hedlund also denounced the belief that New York state markets should be reserved for New York producers, and that buyers really don't care how much they pay for products as long as it's no more than others pay.

Stressing the importance of marketing to the nation's economy, Prof. Hedlund pointed out that the cost of marketing farm products is 63% greater than the cost of producing them.

"During recent years we have begun to recognize the importance of marketing," he stated. "This is a change. Our need now is for more knowledge and understanding to the end that farm products will be marketed as efficiently as is possible."

Prof. Hedlund hit the idea that the population explosion will create so much demand that production will be a bigger problem than marketing. "In the U.S., we always have had a growing population and during part of our history it grew more rapidly than today," he explained. "Yet the Malthusian law has never operated in the U.S. Production during recent years has expanded more rapidly than population and promises to do so for the immediate future. And, if prices improved, production could be expanded even more rapidly."

Prof. Hedlund also said declining prices do not necessarily cause farmers to increase production in order to maintain their income, noting that an upward trend in production has made this untrue.

"I suspect that there are cases where specialized farmers with few or no alternatives may tend to increase production when prices fall," he said. "At the same time, however, other farmers are shifting out of this product because of the lower prices while still others are quitting farming entirely. These farmers tend to offset those who increase production.

"In a market economy, the surest cure for low prices is low prices and the surest deterrent to high prices is high prices."

Equipment Leasing Reporting Expanding

CHICAGO—"The volume of small-business leasing is expanding at a rapid rate," said Robert Sheridan, president of Nationwide Leasing Co., Chicago.

Speaking at the recent Management Seminar for Smaller Business at the University of Chicago, Mr. Sheridan remarked: "It is quite possible that in 10 years half of the production equipment being used by firms of this size will be leased equipment."

Equipment leasing, he said, helps small business overcome the tight money situation and provides the long-term financing smaller firms need.

More than half of all equipment leases being written currently are for firms with total assets of $500,000 or less. Average length of the leases is 3.7 years.

Small business now provides almost 21% of the dollar volume of equipment leased, compared with only 11% two years ago.

Mr. Sheridan cited three reasons why smaller firms have turned to equipment leasing:

"(1) Since equipment leasing terms are normally for three years or longer, this provides long-term credit. This credit is important to small firms wishing to expand or modernize.

"(2) Recurrence of periods of 'tight' money.

"(3) Manufacturers are using more merchandising-leasing plans. This makes long-term leasing available more readily and results in a large volume of smaller lease transactions."

FARM BUSINESS CONFERENCE

BERKELEY, CAL. — "Farmer Cooperatives — Foundation and Forecast" will be the general theme of the American Institute of Cooperation's 32nd national farm business conference to be held on the Berkeley campus of the University of California Aug. 7-10.

1-TON FERTILIZER PRIZE

ORLANDO, FLA.—Formal opening of the new store of Sanderson's Nursery and Garden Shop, operated by Bob Sanderson, has been held at 3730 Kuhl Avenue.

For the formal opening the store had as its grand prize one ton of fertilizer and also held a truck load sale at the store. A trailer truck was parked on the parking lot and customers paid for the merchandise inside the store and then picked up the bags at the truck.

The store has been in business in Orlando for a number of years.

Banks and PCA's Can Help Dealers Solve Accounts-Receivable Problem

By Dr. R. A. Bailey
Ohio State University

EDITOR'S NOTE

The results of a survey among 35 representatives of commercial banks and Production Credit Associations are summarized and interpreted by Dr. R. A. Bailey, professor of agricultural economics and rural sociology, Ohio State University, in this article adapted from a talk he presented at an agricultural marketing conference sponsored by his department. This article should help farm supply dealers with an accounts-receivable problem find answers to questions they have about getting help from financial institutions.

Dr. Bailey

What help can financial institutions offer the farm supply dealer with an accounts receivable problem?

Some 35 representatives of commercial banks and Production Credit Associations were consulted to help provide the answer. This article is based on reaction of the 35 finance men to the following two questions:

1. What have you in your institution already done or what do you presently have in the way of programs or facilities for picking up the accounts receivable of grain, feed and farm supply dealers? What has been your experience and how has it worked?

2. What recommendations would you make regarding possible additional means by which you might assist dealers in preventing the further build-up of their accounts receivable?

Two fundamental facts are clear, as we summarize and interpret their ideas:

1. There is no easy pat solution to your problem; no new miraculous process by which you can shift the burden of financing your present receivables load to one or another of these banks and PCA's.

2. There are, according to these bank and PCA sources, a number of things you can do; a number of things they can help you do to lighten your load.

Examination of Details

Let's examine in detail the two main questions: First, in a nutshell: What are the chances of someone's financing your receivables?

We have all heard that this is an accepted method of business finance, used extensively in manufacturing and wholesaling lines. Finance companies started financing receivables in the period following World War I. They grew slowly until the period just prior to World War II, but took a sharp upturn in the war period and have been growing rapidly ever since, to the point where they now finance an annual volume of some $5-7 billion of receivables. This business is concentrated largely in non-agricultural manufacturing and wholesaling lines and, to the best of my knowledge, they are not active in the receivables financing of agricultural firms. It is possible, however, that they might be worth investigating as a possibility.

Some commercial banks also do receivables financing, but the bulk of this business is done by specialized financial institutions. In their operations an agreement is executed with the manufacturer or dealer to either: (1) Purchase his customer's open accounts receivable as they arise, or (2) advance him loans secured by the pledge of the receivables, with recourse to the manufacturer or dealer for credit losses. A maximum total amount is established on the basis of the firm's financial position and the quality of its receivables.

The firm does its own examination, passes on its customers' credit and handles its own collections. As sales are made, copies of the invoice are sent to the financing institution which returns its check to the firm. As payments are received by the firm, the checks are endorsed and forwarded to the financing institution to "complete the transaction." The customer is usually not even aware that any financial institution is involved.

Here is a nice, neat financing method—at least on the surface. To what extent is it available to you through arrangements with your local banks and PCA's? Let me refer to the survey mentioned earlier.

ACCOUNTS CAN'T BE TRANSFERRED EN MASSE—First, several of the banks and PCA's are involved in some sort of receivables financing arrangements on a limited basis. So far as these arrangements are concerned, we have to recognize and understand one basic point. In the eyes of the bank or the PCA, this is not a means for transferring your present accounts, en masse, to them. For some of the accounts this shift can be made, but most of those now on your books will have to be worked out on an individual basis.

In this regard, every one questioned made the point that he was not interested in financing only those accounts that had gotten out of hand. Several had suggestions, however, for helping reduce the load. "Bring us a list of your receivables," they said, "and let us review them with you. Some we will be able to take over in the course of our normal credit operations.

"Some of the farmers on your books will also be our customers. Since we like our borrowers to have clean financial statements, we will at least discourage them from running up additional accounts."

Returning to the No. 1 question, that of financing your receivables with banks or PCA's, it must be pointed out that attitudes of the finance men varied widely. Some seemed to have had favorable experiences with such programs and were receptive to the idea of going farther with them. Others were noticeably cooler and some "wouldn't touch the thing with a 20-ft. pole."

DEALER MUST MEET CERTAIN CONDITIONS—On the basis of their comments, it appears as though you stand a fighting chance of working out a program for financing at least a part of your new accounts (your future receivables) with your banker or PCA if you can meet certain conditions and are willing to take on the responsibility for certain credit practices. The conditions you will have to meet are essentially these:

1. Since whoever finances you is going to require security over and above the receivable itself, your firm is going to be endorsing the liabilities of your customers in the majority of cases. Here the net worth and general financial condition of your firm becomes all-important. Your endorsement won't mean much if there is nothing behind it.

2. Additional security, in the form of a promissory note signed by the customer, will be required. This, according to every one of the men I questioned, is a key move at the outset of the account. They say that before you approve the account, the situation should be explained to the customer—he should know that the note may be discounted—and his note signed. Whether the note is discounted or not, this is a sound credit practice.

3. Obviously, the customer's note is only as good as his repayment capacity and his financial position. If the program is to work—if it is not to be loaded down with problem accounts—some investigation of these factors is essential. You are inevitably going to refuse some accounts if you follow this practice, and you may lose some business. I am convinced, however, that you will lose less than you anticipate, and that you will be better off by virtue of having lost some of it.

CREDIT BUSINESS DEMANDS SOUND CREDIT PRACTICES—Some dealers will say that these steps are impractical.

My only answer is that we don't get something for nothing; we can't eat our cake and have it too. If you are going to get in or stay in the credit business, we are going to have to do credit examination and comply with the fundamentals of sound credit practice.

Given these conditions:

1. Sound financial condition of your firm,

2. Performing basic credit examination prior to approval,

3. Use of the promissory note,

what are the chief features of your receivables — financing program (if it is set up along the lines of those now in operation)?

1. A maximum amount that can be financed will be established for your financial position.

2. Periodic financial statements will be required.

3. A maximum will be set for the size of the individual accounts.

4. You will have the responsibility for credit examination. Your PCA or bank will establish the minimum standards for what constitutes an adequate examination. Certainly some kind of financial statement will be included, plus means of repayment. The hogs or wheat crop you think will be available may very well already be obligated to someone else.

5. A promissory note, as we have already said, will be required from your customer. You will have the basic responsibility for collection of the account. Your bank or PCA may send out first notices, but slow pay is still your responsibility.

6. In nearly all cases you will endorse the note or assign it, with recourse, to your financing agency. In a few cases, those of top-notch risks, the notes may be assigned without recourse.

By the way of summary, it is obvious that the receivables—financing programs as set up with banks and PCA's—do not give dealers a means of getting rid of slow pays, deadbeats and generally undesirable accounts. Neither do they offer any particular opportunity to the firm that is hanging on by a well-worn shoestring. They do, however, provide a means whereby a basically sound firm doing business with reasonably sound and well-informed farmers can take some of the pressure off its operating capital.

WILL RECEIVABLES - FINANCING PROGRAMS EXPAND?—What can we expect in the way of expansion of receivables - financing programs as we look ahead?

Whether we are talking about commercial banks or about production credit, the programs are limited now and in all probability will continue to be limited to the accounts of comparatively few dealers and to only a part of the receivables on the individual dealer's accounts. Almost without exception, the finance men surveyed indicated that there were enough problems involved in their receivables financing programs that they would be reluctant to move much farther into this type of financing. Without exception, they told me that they would prefer to finance your customers directly if given the oppportunity.

Many reasons were given by the

(Turn to BANKERS, page 17)

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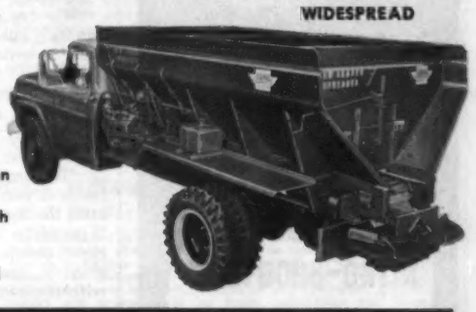

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FARM SERVICE DATA

EXTENSION SERVICE REPORTS

Excessive amounts of irrigation water may cause loss of nitrate nitrogen from the soil, according to studies conducted by the Colorado State University Experiment Station and the U.S. Department of Agriculture.

C. W. Robinson, assistant agronomist with the experiment station, reports a higher yield of corn on a basin flood type system of irrigation with 30 in. of water than was obtained on a sloping furrow system with 97 in. of water.

The yield with 30 in. of water in the basin type was 161 bu. an acre, while the yield dropped to 148 bu. on the plot using 97 in. of water in the sloping furrow. Crop analyses showed that corn plants in the basin plot recovered 95% of the fertilizer nitrogen.

Plants in the sloping furrow plot recovered only 51% of the fertilizer nitrogen, indicating that only about half of the applied nitrogen was used by the corn receiving the larger amount of water.

When 97 in. of water was applied, researchers found that 54 in., or more than half, ran off the plot. In addition, the net irrigation of 43 in. of water apparently leached the fertilizer nitrogen out of the root zone more so that the 30 in. of water used in the basin flooded plots.

Excessive irrigation, coupled with other factors, such as seepage, creates conditions that are not conducive to maximum crop growth on soils of the Upper Colorado River Basin, Mr. Robinson says. Also, he added, efficient use of water should have a beneficial effect on the water table elevations.

"With the system of irrigation commonly used in this valley, much water runs from the lower end of the field in order to wet the soil throughout the root zone on the higher ground. Not only is water being wasted from the land, but over-wetting may occur in part or all of a field," Mr. Robinson concluded.

★

Chemical fallowing may prove to be a valuable dryland farming practice in Montana, Eugene Heikes, extension weed specialist at Montana State College, predicts. Its success and acceptance will depend largely on development of effective herbicides, he believes.

The practice involves spraying soil with chemical weed killers, thus eliminating most mechanical fallowing operations. It also leaves more plant residue for ground cover than ordinary tillage operations and thus aids in reducing soil losses by wind erosion.

Citing results of tests he said chemicals that might be used for fallowing must be ones which will control a wide range of grasses and broadleaf weeds without injuring crops usually planted after a normal fallow period.

Other research has indicated that crop yields are slightly lower on chemically fallowed than on mechanically tilled areas. Loose soil developed by mechanical tillage reduces moisture evaporation, Mr. Heikes pointed out, adding that less moisture is lost by chemical fallowing because of a lack of stirring and airing of the soil.

Eastern Montana branch experiment station researchers have found that a combination of mechanical and chemical gives the best results. One tillage operation is made in early spring.

Chemicals are applied in late spring with one additional tillage operation in late summer. Chemicals eliminate about two of the normal mechanical operations, the researchers say.

★

The value of soil tests was proved in Marion County recently when a cooperative mass sampling revealed at least one reason why crops in that area aren't growing as well as they should.

Too little boron (an important fertilizer) was found in 209 of the 228 soil samples taken. Of these, 158 were critically low, reports Arthur S. King, Oregon State College extension conservation specialist.

Soils on 66 farms within a 7-mile radius of Stayton were tested as a cooperative effort of Oregon State College, fertilizer dealers and the Stayton Canning Co. The mass testing was initiated by the canning cooperative which felt that growers could improve production of some crops—especially sweet corn.

Soil samples were analyzed in the OSC soil testing laboratory. The testing service tells how much fertilizer is needed to grow a particular crop on certain soil. Each of the Marion County samples was checked for corn, beans, carrots, and strawberries.

Forty-four samples were low in phosphorus, 24 critically low. But 75 samples were real high, which reflects a heavy use of phosphorus fertilizer by some farmers who may be applying more phosphorus than they need, Mr. King observed.

As for potash, 90 samples were below the level considered adequate for most crops.

The tests uncovered a shortage of magnesium on 15 samples. This was the first indication of magnesium shortages in the main Willamette Valley.

Mr. King pointed out that taking many samples in a concentrated area provides good opportunity to compare soils and see what shortages are present in the area. Similar cooperative operations are under way near Gresham and Eugene.

Trade Winds From California

CAMINO, CAL.—C. R. and Elizabeth J. Clover have started the Clover Nursery, one mile east of here on Highway 50.

●

GUALALA, CAL.—Norman Reiger is the operator of the new Gualala Nursery in this summer resort town.

●

RED BLUFF, CAL.—Newest nursery and garden shop is the one operated by Roger and Al Schenken, at 735 Rio St.

●

GRASS VALLEY, CAL. — Leslie, Lowell and Arthur Lolmaugh have incorporated as Lolmaugh's Distributors, Inc. The firm will specialize in chemical products.

●

NOVATO, CAL.—Robert L. Strockbine has opened the North Bay Garden Supply Store at 1438 Indian Valley Road.

●

FRESNO, CAL.—Agricultural Suppliers, Inc. has been formed by Forrest G. Lackland of 1430 West San Jose and Patrick H. Douhan, 4585 E. Michigan. Incorporation was for capital of $200,000.

●

SANTA ROSA, CAL.—Allen and Lucile Ellis are now selling garden and farm supplies at 5320 Redwood Highway.

●

CLARKSBURG, CAL.—The R. F. Supply Co., Inc. at Jeffers Blvd. and Courtland Road, is a new store dealing in garden and farm supplies, in Clarksburg.

●

PORTERVILLE, CAL.—The M and W Flying Service, a new crop dusting firm, has been incorporated with a capital of $25,000. John P. Thomilson, Richard W. Merritt and Alexander Wright are the partners.

●

WOODLAND, CAL.—Roy and Virginia Manas and Norman Varian have incorporated as the Man-Air Dusters, Inc., 1 Clanton Ave., Woodland.

●

CARMEL, CAL. — The Oleander Garden Shop is now in business at 8 Pilot Road, Carmel.

●

SAN LEANDRO, CAL.—The Hasegawa Nursery has been opened at 1555-166th Ave., San Leandro by Nori Mitsuo and Akira Hasegawa to retail chemicals and other products for home garden use.

●

SAN LEANDRO, CAL.—A second nursery in San Leandro is the Naka Nursery, at 15940 Maubert Ave., opened by Shigeharu Nakamura.

●

MADERA, CAL. — A new garden and farm supply store had been opened by Robert W. King under his own name at 12523 Highway 99 at Borden in Madera.

●

FRESNO, CAL. — The S and J Ranch, south of Fresno on Highway 41 at Avenue 10, has opened a new garden and farm supplies retail outlet, dealing in chemicals and other related farm items.

SIDELINE

(Continued from page 9)

ing among laymen in the field. Some farmers are careless in the handling of potent chemicals, while others waste the material by improper application.

"We try to educate all farmers, whether our customers or not, what each insecticide is and how it must be applied," said Mr. Gill. "Sometimes a bit of extra supervision will prevent damage to an adjoining crop, or to livestock or humans."

When the firm sells a sprayer, one of the brothers usually follows or hauls it out to the farm, then stays until the farmer knows how to operate it properly. This means putting in the right chemicals, calibrating the machinery, and driving a few rounds with the owner to get him started.

"A dealer should know his chemicals," said Mr. Gill. "In fact, he can become a specialist and be of much help to farmers. Learning at what temperatures each chemical works best has been useful to us. We find that some are more effective than other materials during cool weather, but not many farmers knew this. Some farmers didn't know how long to let alfalfa stand after insecticide treatment before harvesting it. We have devised figures for each type of material and make these available to growers of this area."

The Roswell Seed Co.'s main business is selling alfalfa and small grain seed. They own a large building that reaches from the street to the alley, then right on the other side of the alley their large fenced-in lot is used for storage and display of sprayers.

In addition to items already mentioned, the firm maintains a supply of many farm and livestock products. One result of their seed treatment business has been the sale of soil sterilants, fumigants and garden supplies.

Going to a farm and showing the owner how to fumigate a grain bin may require a sizable part of the morning, but usually it pays off in future sales. After one such job, others will hear about it and the store may gain several new customers.

"Anybody can sell seed and sprayers and insecticides," said Verdi Gill. "But we have found that to be successful you must sell service and good will also. There is so much to learn in this fast-changing ag-chemical field that a dealer must stay up with new developments.

"And when he learns something useful, he shouldn't be too modest about letting others know. Getting out of the store and showing people how you can help them is usually a good way to increase sales and profits."

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OSCAR & PAT

By Al P. Nelson

It was a foggy, drizzly May morning when Oscar came to work at 6:45 a.m. He was always the first one at the Schoenfeld & McGillicuddy store, for it gave him extreme pleasure to be able to silently criticize the sleepy employes who came at 7 o'clock.

Folding his umbrella, Oscar took out the office key from a baggy pants' pocket, inserted the key into the lock and opened the door.

"Ach," he said, feeling warm air stir against his face, "that Irisher must haf worked last night. He forgot to turn down the heat. Himmel, I work to safe money and he throws it away."

He went to the thermostat and angrily shoved it down to 50° in a subconscious move to save heat, to try to make up for the heat Pat had wasted.

After he had removed his worn felt hat and mackinaw he looked around the office to see if anything had been disturbed from the previous night, as he recalled it. First he inspected Tillie Mason's desk, then his own and then Pat's.

"Ach, look at that desk!" he said in disgust.

Pat evidently had been clipping magazines, for newspaper and magazine clippings lay everywhere. Residue of clipped papers lay on the floor at Pat's desk.

Oscar hastily thumbed through the clippings. "Junk!" he muttered as he tossed aside fertilizer and farm chemical clippings about cropland and pastures.

It was then he saw a clipping pasted to a sheet of paper. Printed in ink were the words "For Oscar."

Curiously Oscar picked up the clipping and read:

"There are five ways in which we may be quickly and almost spontaneously judged by the people we meet in business and everyday life. People will judge us by:

"1. How we look.
2. What we do.
3. How we do it.
4. What we say.
5. How we say it.

"In other words we are 80% attitude and 20% appearance to the person we have just met, and there are those who tell us that first impressions are lasting impressions."

On the edge of the clipping concerning the 80% attitude quota were the words printed in blue ink, "Oscar, old boy, when will you get wise?"

Anger surged through Oscar's thick neck, through his cheeks and over his partly bald head.

"Stinker!" he yelled. "Iss that all he's got to do to cut clippings criticizing me? Why don't he criticize customers that don't pay their bills to us, some of those he schlaps on the back all the time?"

His lips tight, he read on, his heart thumping angrily. "A person who hasn't learned the importance of attitude, either doesn't know, or doesn't care, what kind of an impression he makes on a customer. He doesn't realize that in the other fellow's mind, he is manufacturing a picture of himself which may be difficult to change . . . a picture that can hurt him and his company in a great many ways." Most of the words in this paragraph were underlined and connected with an arrow which lead to one word on the margin "OSCAR ! !"

Oscar swallowed hard. With trembling hand he reached for the phone and called Pat McGillicuddy's home. Nora, Pat's wife, answered. "Iss that Irisher up yet?" Oscar barked.

"Oh, he's on the way to the office," Nora said sweetly. "He should be there any minute now."

Oscar paced up and down the salesroom floor, holding the offending piece of paper with the clipping pasted on it, as though he would destroy it with the ferocity of his anger.

While he was pacing, the door opened and in stepped tall, blue-eyed and hatless Pat McGillicuddy.

Oscar turned on him. "This-this clipping!" he yelled. "I found it on your desk. Ach, iss that all you haf to do—clip stuff to insult me, andt mark it up? Go andt insult some of them customers that don't pay us. If you don't I will!"

Pat's level gaze inspected Oscar for a few moments. "So you've been snooping on my desk again, eh?" he asked.

"I got a right to look at anything in this office!" Oscar came back furiously. "I own haf of everythink here."

"I was hoping you wouldn't find that clipping," Pat said. "It came yesterday in the mail. I hid it under some papers on my desk."

Oscar stared unbelievingly. "Now, you are lyink and tryink to get oudt of it. That printing is yours."

"It is not!" Pat snapped. "And don't call me a liar! That's dangerous. I'm warning you."

Oscar glared, like a rooster raising his feathers for an attack.

"Maybe the envelope is still in the wastebasket," Pat said. He took his basket and emptied the contents on the floor.

He bent and searched through the papers. Finally he came up with an envelope. "Here it is," he said. "No return address. It was mailed at Benton."

Oscar took the envelope and inspected it. "Maybe you took it to Benton andt mailed it," he suggested sharply.

"I did not!" glared Pat, clenching his fists.

"Or some delinquent customer mailed it?" Oscar growled.

"I don't know about that, "Pat answered coolly, "but if the shoe fits—wear it, Oscar. Wear it every day." And with that he went out the door.

Oscar took the clipping and went slowly back to his desk. Again he read it, and the flush mounted on his face and his lips tightened.

"I'm right!" he said, pounding the desk with a chubby fist. "I know I'm right. If efferbody wouldt watch the pennies like I do, haf the trouble in the worldt would be cured."

ENTOMOLOGIST DIES

WILMINGTON, DEL.—Dr. Louis A. Stearns, 67, nationally known entomologist, died recently at the Veterans Hospital here after a short illness. Dr. Stearns, professor emeritus of the University of Delaware, had retired in 1957 from the university after serving nearly 28 years there as head of his department. He had a heart ailment for several years that was climaxed by a stroke.

Books on Pesticides

THE GARDENER'S BUG BOOK (1956)
Dr. Cynthia Westcott

The Complete Handbook of Garden Pests and their control. Information, scientifically accurate but easy to read on 1,100 insects, mites and other animal pests that attack trees, shrubs, vines, lawns, flowers, fruits and vegetables in home gardens. Illustrations in full color. Control measures combine the latest in chemical developments with time-honored cultural measures. Helpful to all who serve the general public and to truck farmers and fruit gardeners. 579 pages, cloth bound $7.50

HANDBOOK OF AGRICULTURAL CHEMICALS —Second Edition
Lester W. Hanna, Agricultural Enterprises, Forest Grove, Ore.

As the title implies, this book contains broad information and tables on not only the chemical products themselves, but also on toxicity, residues, registration, terminology and emergency treatments. A fold-out chart gives compatibility data on numerous materials for formulators. Information on fertilizers includes soil elements, trace minerals, and application techniques. Descriptive material is also presented on fumigants, fungicides, herbicides, systemics, growth modifiers, livestock chemicals, rodenticides, and antibiotics. Information on materials and techniques is written fully with illustrations and tables. 490 pages..... $5.95

INSECT PESTS OF FARM, GARDEN and ORCHARD—Fifth Edition (1956)
Leonard M. Peairs and Ralph H. Davidson

A standard text for 44 years. Includes insects affecting grasses, grains, cotton, legumes, vegetables, flowers, fruits, stored products, household goods and domestic animals. Contains a new chapter on insecticide formulations, spray mixtures, application equipment, etc. Material on forty new pest species added, including drastic changes in the illustration. 661 pages $8.50

DDT and NEWER PERSISTENT INSECTICIDES
T. F. West and G. A. Campbell

The first and major part of book is devoted to the physical and chemical properties, manufacture, formulation and applications of DDT. The second part deals with other chlorinated hydrocarbons whose insecticidal properties have been discovered recently and compares these new insecticides with DDT. The preparation of aqueous suspensions, solutions, emulsions, and dusts containing DDT, the compatability of DDT with other insecticides, fungicides and additions are covered in detail. Contains dozens of tables on the solubility of DDT in various solvents, the catalytic activity of accessory substances in the presence of DDT, analogues of DDT, the comparative toxicity, hydrolysis and solubility of DDT analogues, the toxicity of DDT for almost all important insects, etc. Many illustrations $8.50

PESTS OF STORED GRAIN AND GRAIN PRODUCTS
Richard T. Cotton, Stored Product Insect Section, U.S. Department of Agriculture, Washington, D.C.

Dr. Cotton's valuable book is full of practical up-to-date information on the problems of insect and rodent contamination. Some of the main topics covered are: methods of detecting contamination in cereal from rodents, birds and insects; prevention and control of insect infestation in grain; new methods of storage; methods of sanitation in grain storages and processing plants; the latest information on fumigation; heat sterilization; and protection of stored seed. This book is concise, readable, completely indexed and includes over 100 figures and illustrations. 306 pages, 8½x5½", photo offset, illustrated, cloth bound.... $4.00

METHODS OF TESTING CHEMICALS ON INSECTS—Vol. I
Harold H. Shepard, chief, Agricultural Chemicals Staff, Commodity Stabilization Service, U.S. Department of Agriculture, Washington, D.C.

This is Vol. I of a proposed three-volume study. It describes methods of studying the effects of chemicals on the physiology of insects. Also covered are general techniques for applying chemicals to insects. It includes laboratory screening methods for determining the killing efficiency of insecticidal sprays, dusts and fumigants. Its 14 chapters are authored by prominent entomologists from USDA and State Experiment Stations. 355 pages; 8½x5½" photo-offset, cloth bound $5.00

THE CHEMISTRY AND ACTION OF INSECTICIDES
Harold H. Shepard, Entomologist, U.S. Department of Agriculture, formerly Associate Professor of Insect Toxicology, Cornell University.

Treats the chemistry of insecticides, the history of their use, their commercial importance here and abroad, the nature of the major uses, the influence of environment on effectiveness. Materials are arranged according to their chemical relationships. Two chapters relating to organic compounds largely new as insecticides. Illustrative data in form of tables, and a convenient appendix of equivalents arranged for practical use in the field. 594 pages $10.50

ADVANCES IN PEST CONTROL RESEARCH—Vol. 2
Edited by R. L. Metcalf, University of California, Citrus Experiment Station, Riverside, Cal.

This book, an annual series, treats pest control as a distinct discipline, discussing chemical, physical and biological methods from the common viewpoint of the basic principles involved and applying them to the control of weeds, fungi, bacteria, insects—all organisms which compete with man for his food supply, damage his possessions, or attack his person. Each annual volume contains chapters contributed by outstanding scientists having intimate knowledge of various pertinent topics within the field, presenting not only comprehensive reviews of recent advances but also critical evaluation of new developments and concepts. This volume continues the same plan which won immediate acceptance for the series. In eight chapters, a group of experts present and interpret recent advances in subjects ranging from the innate toxicity of fungicides to isotope dilution techniques and the spread of insecticide resistance, 1958; 434 pages, 110 illustrations, 43 tables $12.50

INSECT, FUNGUS AND WEED CONTROL
Dr. E. R. de Ong

The information is grouped according to field of application rather than to chemical composition or nomenclature. Chapters on insecticide label, seed disinfectants, herbicides, forest insects and diseases, livestock insects, and the pests found in household and industry. Fumigation of warehouses, residual sprays and preservatives for fruits, vegetables and wood products are covered. An up-to-date guide on pest control with the needs of operators, agricultural and structural specialists carefully considered. Shippers and warehouse personnel will find the book useful $10.00

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WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board

Mallow

(Malva rotundifolia L.)

How to Identify

This weed is also known as common mallow, dwarf mallow, running mallow, and "cheeses." It has leaves nearly round with the edges slightly lobed and crisped. The seeds are arranged in a circle within a cup made by the calyx bracts. They are dark grey, flattened, and nearly circular with a notch at one side. The plant has a prostrate habit of growth, with stems extending from the crown from one to three feet.

Where Mallow Is Found

The weed is found largely in cultivated ground, farmyards, waste places, and in lawns. One reason for the ubiquity of the plant is the fact that clover and lawn seeds often contain mallow seeds as well. Distribution of the plant is general throughout the north central states.

Habits of Mallow

The plant is an annual or biennial with short straight taproot, reproducing only from seeds. Seeds are reddish-brown, about 1½ mm. long, notched. The plant flowers May to October, and seeds June to November. Mallow is not a native of North America, having been introduced from Eurasia.

Control of Mallow

Chemical herbicides are effective in controlling this plant but, according to some authorities, several applications of 2,4-D are required to eliminate it completely from a given area. Cultural methods include plowing up infested land where possible, and planting to a cultivated crop. Hoeing or pulling up the plant before the development of seed is effective where only a small area is affected.

Photograph of Mallow furnished through courtesy of The Dow Chemical Co., Midland, Michigan.

BANKERS

(Continued from page 11)

banker and production credit correspondents for this position. Here are some of their thoughts and comments without any particular attempt to present them in order of their importance.

One basic idea can perhaps best be expressed with a couple of quotations. One banker said:

". . . Existing credit agencies could, if they have the opportunity, lend most of the money that farmers need for operating capital. This is true only when and if the credit agency has all the facts concerning the operations of the farmer."

Another banker who had many years of successful experience as owner and operator of a farm supply business before entering the banking field, commented that the dealer has a full-time job without getting involved in the credit business. He said:

"Dealers should refer their accounts to the bankers they trust and stay out of the financing business unless they have the money to carry the load. Let the bankers handle finance and let the dealers sell and service, buy and sell."

Other Comments

Comments along similar lines—that both the credit business and the elevator, feed or farm supply business are full-time jobs, and that the greatest benefit results from specializing in one or the other—were received from a number of other bankers and production credit men.

Another basic comment made by a number of the finance men was that dealers do the same thing they would do if they were in the dealers' shoes—keep the good accounts which pose no particular payment problem and attempt to get rid of the bad ones.

Other men commented that a receivables financing program is no good for anyone concerned unless a satisfactory repayment program is worked out by the customer. One said:

"We do discount some dealers' notes that are taken after a time on accounts that are slow. In the end, however, we usually have to call in the farmers, get the information that should have been obtained in the first place, and then work out a practical repayment plan. With or without recourse, a loan or account is no good unless there is a practical repayment plan pre-arranged."

These men make the further point that if satisfactory plans can be worked out, then the customer is certainly eligible for credit from established sources, so why not get it directly from that source?

CREDIT AGENCIES CAN PROVIDE ADDITIONAL SERVICES—Thus far the question of the credit institution's role in financing the dealer's receivables has been discussed. Let's examine briefly the question of what additional services your credit agency can give you, drawing heavily on suggestions from bankers and PCA men for the answers.

Already mentioned is the practice of periodically reviewing accounts with your credit agency, and the relief this can give you. Along this line the idea of getting acquainted with your banker, of keeping him up-to-date on your financial condition and your prospective operating capital needs, and of using pre-planned and pre-arranged credit instead of emergency (I need it yesterday) credit certainly has merit.

Credit agencies can help indirectly in a way which this quotation from a banker's letter illustrates:

"Really, the dealer would do well to advise the purchaser to work out well in advance, with the one from whom he is in the habit of borrowing, a program for meeting his credit needs. Then, if he is not entitled to credit from that source, trouble is just being invited when accounts of that farmer are put on the books."

Comments to the effect that much trouble stems from inadequate information came from all directions. Two quotations are typical:

"In my opinion, many accounts receivable become frozen because too few questions were asked and too little information was secured about when and where the payment was coming from and, whether or not, under reasonable conditions, the farm operation in question would provide the money for payment. In other words, you cannot pay from hogs in five or six months from now unless you are buying hogs or have sows about ready to farrow, to fatten them out."

"In my opinion at least 90% of our credit problems here in our bank are solved when we obtain sufficient information at the time of making the loan. Likewise, I feel that the dealer can, if he expects to carry the account, help his situation materially by following the same procedure."

The credit people surveyed generally recognized that credit examination is not an easy job; that it can be time-consuming and even offensive to a customer when not done in a skillful way. Most of them said that they would be more than willing to give dealers the benefit of their experience in this job—to work with dealers in a training program designed to teach them the "tricks of the trade."

Spencer Chemical Co. Sales, Earnings Dip

KANSAS CITY—John C. Denton, Spencer Chemical Co. president, has reported that unusually severe weather in the quarter ended March 31 delayed the movement of fertilizer and that a change in foreign marketing methods temporarily affected export sales of polyethylene. This resulted in reduced sales and earnings for the company for the third fiscal quarter and the nine months ended March 31, as compared with a year earlier.

The unseasonable weather during the quarter ended March 31 caused spring purchase and application of fertilizer to be deferred, Mr. Denton said. The return of a more normal weather pattern was immediately reflected by a sharp rise in sales of agricultural nitrogen products during April.

The business prospects for the fourth quarter ending June 30 are considered to be very good, Mr. Denton said. Gains should continue in industrial chemical sales and in domestic sales of polyethylene. The company is in an excellent position to meet the peak season demand for fertilizer materials with well-balanced inventories and plants operating at capacity, he added.

In the nine months ended March 31, sales were $35,938,049, compared with $36,367,640 a year earlier. Net income was $2,181,694, equal after preferred dividends to $1.57 a common share, compared with $2,228,585, or $1.62 a share, a year earlier. Expenditures for research and technical activities during the nine-month period were about $350,000 larger than a year before.

During the three months to March 31, net sales amounted to $11,417,107, compared with $12,489,063 a year ago. Net income was $415,681, equal to 25¢ a common share, compared with $854,576, or 64¢ a share.

Directors have voted the usual quarterly dividends of 60¢ a share on the common and $1.05 a share on the preferred, both payable June 1 to holders of record May 10.

The Week in WASHINGTON

By JOHN CIPPERLY, Croplife Washington Correspondent

Indications of a compromise over present wheat legislation seem to eliminate any chance that maximum limits of the Conservation Reserve Program will be expanded at this session of Congress to the 60-million-acre goal urged by the U.S. Department of Agriculture.

At the present there are about 29 million acres of farmland under the reserve program, of which about two-thirds represent the inclusion of entire farm units. Experience with the Conservation Reserve Program has persuaded USDA officials that the most effective way to get land out of field crop production is to remove whole farm units.

While this conclusion may be readily sustained, at the same time there are some important influences which probably would raise substantial objections for expanding this program—particularly if it featured the entire farm unit concept.

Those influences reflect the money lending institutions which may see in the whole farm removal concept a condition even worse than a drastic cut in price supports, since a farm unit removed to the conservation reserve eliminates a farm component from the economic life of a community, whereas the lowered price support level theoretically still retains the farmer as a potential customer in that community.

It is also believed that Congress itself has lost its original fascination with the conservation reserve. It will only require a show of force by the financial institutions—plus opposition of local tradesmen, farm suppliers and such operators as automobile dealers and farm equipment agencies—to kill any expansion of CRP.

Gibberellic Speeds Emergence of Slow Winter Wheat Varieties, Tests Show

WASHINGTON — Treating seeds with gibberellic acid speeds emergence of slow winter wheat varieties, according to federal-state cooperative experiments.

Scientists of U.S. Department of Agriculture's Agricultural Research Service and the Washington Agricultural Experiment Station at Pullman found, in laboratory and field tests, that slow-emerging wheat varieties with gibberellic acid came up almost as rapidly as untreated, fast-emerging varieties.

Rapid emergence is important to establishment of stands in the Pacific Northwest where soil crust or compaction may prevent or deter growth of seedlings through the soil surface.

The treatments are still being evaluated and no recommendation for use is being made at present.

Slow-emerging wheat varieties used included Turkey, Brevor and Lemhi (a spring wheat). Concentrations of 5 to 25 parts per million (p.p.m.) of gibberellic acid seemed best for stimulating emergence without harming the plants.

In one field test, treated Turkey and Lemhi showed 47 and 44% emergence nine days after planting, compared with 51 and 44% for untreated, fast-emerging varieties. The seeds of Turkey and Lemhi were soaked for four hours in 20 p.p.m. gibberellic acid before planting. Untreated Turkey and Lemhi showed only 27 and 33% emergence on the same date.

In another field test, Turkey and Brevor, soaked for four hours in gibberellic acid at 5 p.p.m., gave 52 and 53% emergence 10 days after planting. Emergence for untreated seeds of the same two varieties was 28 and 40%, respectively.

Treatments failed to speed up fast-emerging varieties, suggesting that they may already contain sufficient gibberellin-like substances, the researchers said.

Fungicide, Nematocide Test Results Now Available

WINCHESTER, VA. — The "Results of 1959 Fungicide and Nematocide Tests" is now available. This report is issued annually by the American Phytopathological Society advisory committee on collecting and disseminating new fungicide data. This report serves as a medium for organizing and presenting the summarized results of current fungicide and nematocide testing projects. Information on products available for testing, composition of products and their sources are given.

Copies of this report are available at $1 per copy when accompanied by a remittance, $1.25 when invoiced and billed. Address orders to A. B. Groves, Winchester Fruit Research Laboratory, Route 3, Winchester, Va. Make remittances payable to the American Phytopathological Society.

CHEMICAL CIRCULAR

LINCOLN, NEB. — A circular on "Chemicals That Control Weeds" has been published by the agricultural extension service at the University of Nebraska. The circular includes recommendations for controlling weeds in field crops, pastures, ranges and non-crop lands; lawn and turf weeds, and other troublesome weeds. There also is a section on use of desiccants or chemicals to dry crops and weeds in the field permitting earlier harvest.

Ag Commissioner Named

TALLAHASSEE, FLA.—Gov. LeRoy Collins has appointed Lee Thompson, a State Department of Agriculture career man, as Florida commissioner of agriculture to succeed the late Nathan Mayo, who died recently. Mr. Thompson promised no policy or personnel changes during the nine months he will serve to fill out Mr. Mayo's unexpired term.

FIRE IN ARKANSAS

PINE BLUFF, ARK.—The Planters Fertilizer & Soybean Co. plant here was heavily damaged by fire April 14. The blaze originated at a nearby oil distributing company plant and required the services of five fire companies before it could be controlled. Damage estimates were not available.

BIDS REQUESTED

SACRAMENTO—The federal bureau of land management has asked for bids for aerial spraying of 1,250 acres of government owned land in California to eradicate obnoxious weed seedlings and sprouts.

The spraying will cover 500 acres in the vicinity of Coalinga, 500 acres near Mariposa and 250 acres near the Calaveras county airport at San Andreas.

Farm Income Prospects for 1960 Brighten, USDA Says

WASHINGTON — Developments since last fall have improved farmers' income prospects in 1960, the U.S. Department of Agriculture reported in the Farm Income Situation, released last week.

The index of prices received by farmers has risen 5% since mid-December—mainly because of higher prices for hogs, cattle, chickens and eggs—and is now only slightly below that of a year ago.

Prices of farm products during the remaining months of 1960 are likely to average about the same as, or even slightly higher than, the corresponding months of 1959. Consequently, if growing conditions this year are about average, cash receipts from a continued heavy volume of farm marketings may equal those of 1959. Some further increase in farm production expenses seems likely, however, so realized net income of farm operators from farming may fall slightly short of the $11.0 billion realized last year, USDA said.

This assumes approximately "average" or "normal" weather during the coming season. If actual growing conditions should depart substantially from this assumption, bringing higher-than-average yields per acre, then crop production, price-support loans, cash receipts from crop marketings (including loans), and farmers' realized net income might all be considerably augmented.

Further expansion this year in the nonfarm economy and in nonfarm job opportunities for farm people may well bring a further increase in the total income of farm people from nonfarm sources. With the farm population continuing to decline, per capita income of farm people from all sources should equal the average of $960 in 1959.

Although the seasonally adjusted rate of realized net income in the first quarter of 1960 was substantially below a year earlier, it is likely to show some improvement during the remaining three quarters of the year, USDA said. Realized gross farm income is not expected to change significantly in 1960. Some increase in cash receipts from livestock and livestock products may be offset by a decline in crop receipts; and a small increase in government payments, reflecting an expansion of acreage in the Conservation Reserve Program, may be offset by a further decline in nonmoney income.

The increase expected in total livestock receipts will be due mostly to higher prices of hogs and eggs, larger production of milk may also bring some increase in total dairy receipts. The expected decline in crop receipts is mainly a reflection of lower support prices for wheat, corn and cotton. Total marketings are likely to be up this year for both crops and livestock, but prices are expected to hold up better for livestock and livestock products than for crops.

Farm cost rates, though quite stable in recent months, are at a slightly higher level than in 1959. Total production expenses will probably increase for the seventh consecutive year, but the increase may be the smallest since 1955. It will be concentrated in the overhead items of interest charges, property taxes and depreciation allowances. The total of current operating expenses may hold fairly steady, as a further increase in the cost of hired labor about cancels a reduction in the cost of purchased feed.

Study Shows Small Uptake by Plants of Radioactive Fallout

LOS ANGELES — The uptake of radioactive fallout products by plants from soil is relatively small with most of it concentrated in the leaves and to a much lesser extent in fruits, seeds (or grains), and edible roots.

Such are the conclusions of a study of uptake of fission products by plants from flats of soil exposed to contamination by nuclear detonations at the Nevada Test Site. The study was carried out by Dr. H. Nishita, E. M. Romney and K. H. Larson of the Laboratory of Biophysics and Nuclear Medicine of the University of California Medical Center, Los Angeles.

It was found that radioactive strontium was the fission product most readily taken up followed by radioactive iodine, barium, cesium, and ruthenium. Radioactive cerium, yttrium, promethium, zirconium and niobium were taken up only in trace amounts.

There were considerable differences in uptake of fission products among the plant species, kind of soil and the conditions of plant growth. Of the plants studied, beans and radishes accumulated more radioactive strontium than carrots, lettuce and barley in that order. In all plants, far more fission products accumulated in the leaves than in seeds or edible roots.

The addition of non-decayed organic matter to soil tended to inhibit uptake but it took unusually large amounts of it to make significant differences. Addition of calcium to soils deficient in calcium tended to inhibit the uptake of radioactive strontium. Similarly, the addition of potassium to potassium deficient soil inhibited the uptake of radioactive cesium.

Tobias E. Bradley Dies

PEORIA, ILL.—Tobias E. Bradley, who retired in 1957 as Midwest sales manager for Potash Company of America, died here April 17. He joined the firm in 1942, and since his retirement had been a consultant for the firm.

Mr. Bradley was born Dec. 20, 1891. He is survived by his widow; a son, John; two daughters, Mrs. Fred Bodtke and Mrs. J. R. Dageforde, and seven grandchildren.

NET SALES UP

NEW YORK — Consolidated net sales of Olin Mathieson Chemical Corp. totaled $702,032,000 in 1959, an increase of 17% over the 1958 total of $601,398,000. Net profits amounted to $37,416,000, or $2.81 a share, compared with 70¢ a share in 1958 when heavy non-recurring write-offs sharply reduced the year's income.

REMEMBER TO ORDER
CHASE BAGS
There's None Better!

Florida Vetoes Full-Scale Fire Ant Eradication Plan; Starts Local Program

TALLAHASSEE, FLA.—The Florida Cabinet gave the green light to the State Plant Board to cut out extensive fire ant eradication and spend $60,000 for a local control program.

The Cabinet was told by Broward Culpepper, plant board director, that for some time it has been apparent a full-scale eradication program could not be continued with available funds. The board has spent all but $200,000 of its appropriation.

D. R. Shepherd, a spokesman for the U.S. Department of Agriculture, threw more cold water on the all-out eradication program. He asserted that Alabama has dropped its fire ant program.

Mr. Shepherd told the Cabinet there wasn't much point in trying to get rid of the insect in northwest Florida when Alabama was doing nothing. He added, however, that Georgia was going all-out to get rid of the fire ant within its borders.

Mr. Culpepper estimated that 1½ million acres in Florida were infested. Full eradication would cost $1.80 an acre, he said.

According to W. G. Cowperthwaite, plant commissioner, "most of the infestation is in the panhandle, although 100,000 acres have been reported in Hillsborough County, 30,000 in Duval and 10,000 or more acres near Orlando."

The plant board, at a recent meeting, agreed to spend approximately $60,000 to try and control the ant on some 20,000 fringe acres and in nurseries.

Mr. Culpepper said a budget for use of the control money will be submitted to the Cabinet in the near future when the plant board will request release of the funds.

In other action, the Cabinet released $9,250 to the Plant Board to pay for citrus trees destroyed in the push-and-treat program for eradication of spreading decline in citrus groves.

Sitting in on the meeting for the first time in an official capacity was Lee Thompson, the new commissioner of agriculture. He was named to the office by Gov. LeRoy Collins on April 19.

Collier Introduces New Zinc-Nitrogen Fertilizer

LOS ANGELES—A new nitrogen and zinc fertilizer marketed under the name Brea Aqua-Z is being manufactured and distributed by Collier Carbon and Chemical Corp., Los Angeles. The firm has added zinc as a minor element to its aqua ammonia solution to combine nitrogen and zinc in a solution form.

The firm said that field testing has indicated that zinc is the most widespread micro-nutrient deficiency in western states.

Forest Insect Survey At Work in South Carolina

CLEMSON, S.C.—A forest insect detection survey system has been developed and put into action in the forested areas of South Carolina.

Function of the survey system is to detect outbreaks of major forest insects at an early stage for early control measures.

The program is directed by the State Crop Pest Commission at Clemson College with most of the field plan personnel furnished by technical foresters of the South Carolina Commission of Forestry, the U.S. Forest Service and private industry. These trained observers submit monthly reports on the presence, or absence, of six serious forest insect pests in the permanent observation areas.

The ground survey system will be supplemented this summer with a statewide aerial survey.

Van Waters & Rogers Leases Warehouse Space At Port of Pasco

SEATTLE—The firm of Van Waters & Rogers, distributor of agricultural chemicals, animal health and nutritional products and fertilizers, with headquarters in Seattle, has leased 65,000 square feet from the Port of Pasco, in the Port's recently purchased warehouse complex in Pasco, Wash.

The building, which has a total of 1,382,000 square feet of warehouse space, was used during the Second World War as a lend-lease depot serving Russia and was bought from the General Services Administration for about $1,000,000. In addition to the warehouse space the Port of Pasco obtained 455 acres of land and 375 acres of the tract are available for industrial development, all of it on deep water.

Van Waters & Rogers plans to use its newly leased warehouse space for in-transit storage of fertilizer manufactured in Medicine Hat, Alberta, by a division of Commercial Solvents Corp. It distributes these products—phosphate and sulphate of ammonia—to western Washington, western Oregon and northern California.

Officials of the local company are enthusiastic about the new warehouse arrangement, pointing out its central location in the Pacific Northwest, the fact that it is the center of a highway network to all three states, that it is served by two railroads and the increasing importance of barge traffic on the Columbia River.

"We expect to distribute 10,000 tons of fertilizers from the new center in the coming year," John Buller, Van Waters & Rogers vice president in charge of finance and personnel, said when he returned from completing arrangements for the new warehouse space.

F. S. Royster, Jr., Elected Chairman of Guano Firm

NORFOLK, VA. — F. S. Royster, Jr., son of the founder of F. S. Royster Guano Co., has been elected chairman of the board of directors.

F. S. Royster, Jr.

Mr. Royster succeeds C. F. Burroughs, Sr., who died Feb. 24. Charles F. Burroughs, Jr., remains president of the fertilizer manufacturing firm with headquarters in Norfolk.

Mr. Royster, who has been a vice president and director of the company, has continuous service with the fertilizer firm since Jan. 1, 1914.

He was educated in Tarboro, N.C. where his father founded the company in 1885, in Norfolk and at Princeton University.

Several years ago when the company decided to build a factory at Toledo, Mr. Royster was sent there to supervise operations. In addition to his interest in the fertilizer firm, Mr. Royster operates the 12-story Royster Bldg., a landmark of downtown Norfolk.

Anti-Weed Program Started in California

SACRAMENTO — The California Department of Agriculture is developing a program to suppress leafy spurge, an aggressive perennial weed confined primarily to Siskiyou and Lassen counties.

Some 140 acres already are infested by this pest which is relatively new to California. Through a cooperative control program between the state, counties and landowners involved, the Bureau of Rodent and Weed Control and Seed Inspection is hoping to prevent its spread to other agricultural areas of California.

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	Oct. 10
Oct. 24	
	Nov. 7
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PESTICIDE SITUATION

(Continued from page 8)

federal-state-local program and by individual property owners.

Use of pesticides by the U.S. Forest Service to suppress defoliator infestations in 1959 was not as extensive as in recent years (Table 8). However, against bark beetles more pesticides were used. Herbicide use remained about the same.

Spruce budworm infestations on 134,121 acres in Montana and Minnesota were treated by aerial spraying with a DDT insecticide applied at a rate of one pound of DDT per acre. The same insecticide treatment was aerially applied on 44,851 acres against such forest pests as Douglas-fir tussock moth in Arizona and New Mexico, jack pine budworm in Minnesota, sawflies in Texas and Louisiana, elm spanworm in Georgia, Saratoga spittlebug in Wisconsin and Michigan and pine reproduction weevil in California.

Emulsifiable benzene hexachloride was used as a bark-penetrating insecticide at a rate of 1 to 1.5 lb. per tree for control of bark beetle on an individual tree basis in southern and southeastern states. Ethylene dibromide was applied in fuel oil and water at a rate of 6 lb. per tree as a bark-penetrating insecticide for bark beetle control in the Rocky Mountain and western states.

Lindane was used at a rate of about 2 lb. per tree for bark beetle control in western states and at a rate of about .5 lb. per tree for white pine weevil control in New York. Lindane and malathion were used in combination in pilot tests to control white pine weevil in New York. Sevin was used experimentally in an attempt to control seed and cone insects.

Chlordane was used to control pests in forest tree nurseries. 2,4-D and 2,4,5-T weed killers were applied in blister rust and oak wilt disease control programs. Estimated requirements by the Forest Service for 1960 are expected to be about the same as in 1959.

Production of DDT reached a new high of 156,738,000 lb. in the 1959 calendar year. Domestic and export requirements for 1960 are estimated to be at about this same level. Exports of DDT last year amounted to 74,987,000 lb., an increase of 4,876,000 lb. over 1958. Seventy eight percent (58,497,000 lb.) of 1959 DDT exports was in the form of 75% wettable.

DDT carryover (technical and formulated) was 14% higher Sept. 30, 1959 than on the same date a year earlier. Domestic disappearance during the 1959-60 crop year was 78,682,000 lb., 2.3 million pounds more than was exported in the same period.

If the annual capacity to produce DDT is assumed to be at least 365 times the average daily rate in the month of highest production (June, 1959, when production of 14,004,103 lb. was reported), U.S. DDT capacity would amount to over 177,000,000 lb.

The extent of U.S. shipments of 75% DDT to particular countries during the last two years, chiefly in connection with the malaria eradication program is shown in Table 9.

India and Indonesia had been receiving large quantities of DDT from the U.S. for some years prior to 1958.

Purchases of DDT by the Government Services Administration for the International Cooperation Administration's program of malaria eradication amounted to 35,290,600 lb. (technical basis) during the 1958-59 fiscal year. Most of this quantity was purchased as 75% wettable DDT, only 98,500 lb. being technical.

About 45,000,000 lb. DDT (technical basis) are expected to be delivered by the end of the 1959-60 fiscal year in the ICA program. UNICEF (United Nations Children's Emergency Fund) and the Pan American Sanitary Bureau also use appreciable quantities of DDT in their world health programs.

Production of benzene hexachloride continued to decline in 1959. It dropped to 5,197,000 lb. for the calendar year from an average of about 12 million pounds (gamma basis) for the 3-year period 1954-56. Exports of BHC in 1959 totaled 2,427,000 lb. (gamma basis), 44% going to Brazil. During the 1958-59 crop year inventories were reduced 39%. In December the published quotation for BHC was pared to the lowest level since June, 1955.

Combined production of aldrin, chlordane, dieldrin, endrin, heptachlor and toxaphene during the crop year 1958-59 continued high. Inventories rose over six million pounds while domestic disappearance (73,331,000 lb.) was less by nearly that quantity. Exports by primary producers themselves amounted to 12,208,000 lb. As in 1958, Egypt led all countries as the destination for "polychlor" insecticides, an export category which includes also such chemicals as methoxychlor, DDD (TDE), and pentachlorophenol.

Competition of organic phosphorus compounds with other types of insecticides was strengthened in the fall of 1958 by a drastic reduction in quoted prices for parathion and methyl parathion. Import figures for 1959 are not yet available. Imports declined in 1958 to about one half those the previous year (Table 10).

Stocks of such established materials as parathion and methyl parathion were lower on Sept. 30, 1959 than on the same date in 1958 (Table 11).

As is generally true of newer pesticides, phosphorus insecticides recently coming into commercial production were carried over at the end of the 1959 season as a group in two to three times the volume of the previous year's end-of-season stocks. In many cases, each chemical is made by a single producer, so information as to production and stocks cannot be divulged. Exports of phosphorus insecticides in 1959 were 2.4 times the 1958 level.

The following organic phosphorus compounds are in commercial or semi-commercial production for insecticidal and miticidal uses in the U.S. Trade names, when given, are indicated by quotation marks. The list is believed fairly complete, showing the extent to which this class of pesticides has been developed within a few years.

"Co-Ral," DDVP (dimethyl dichloro vinyl phosphate), "Delnav," Demeton ("Systox"), "Diazinon," "Dibrom," Dicapthon, "Dipterex," "Di-Syston," "Dithiosystox," "EPN," Ethion ("Nialate"), "Guthion," Malathion, Methyl parathion, "Methyl Trithion," Parathion, Phorate ("Thimet"), "Phosdrin," "Phostex," Ronnel ("Trolene," "Korlan"), Schradan, Tetraethyl dithiopyrophosphate, Tetraethyl pyrophosphate, "Tetram," "Trithion."

Production of calcium arsenate declined in 1958 to 10,432,000 lb. from 27,106,000 lb. in 1956, as a result of shifts to other materials to control resistant strains of the boll weevil on cotton. Lead arsenate production in the 4-year period 1952 to 1955 averaged 14,720,000 lb. in the narrow range from 14,196,000 to 15,620,000 lb. Production of this arsenical was just under 12 million pounds in 1956 and 1957, but in 1958 it rose again to nearly 15 million—apparently close to the annual level for combined domestic and export trade of the U.S. Production figures for calcium arsenate and lead arsenate are not yet available for 1959. Exports of lead arsenate now go mostly to Peru.

The proportion of pyrethrum imports in the form of extract rose greatly in 1959 (Table 12).

Imports of flowers dropped to less than one million pounds. The value of all pyrethrum imports climbed to $5,295,467—a 39% increase over 1958. According to reports from Kenya, several years of abnormally heavy rainfall followed by severe drouth in 1959 have resulted in reduced yields of African pyrethrum. This situation coincided with a drive for increased production and sales. However, unsold stocks carried over from 1958 were sold last year to satisfy the rapid increase in demand for pyrethrum. The value of extract exported by the U.S. in 1959 amounted to $224,000.

The General Services Administration made available 141,808 lb. of pyrethrum extract from the national stockpile in April, 1960. Total disposal, inclusive of this offering, will amount to 342,808 lb.

Imports of Brazilian sassafras oil (ocotea cymbarum oil), a raw material in the manufacture of certain pyrethrum synergists, are being reported separately by the Bureau of the Census (code A2290390) beginning with January, 1960.

Imports of rotenone rose in 1959 to 5,930,683 lb., valued at $816,599 (Table 13).

Most of these were cube from Peru; only minor imports of derris were received. New Schedule A commodity numbers became effective Jan. 1, 1960 for imports of cube and derris as follows:

2210290—Cube (timbo or barbasco) root, derris root and tuba or tube root (formerly 2210280 and 2210300); free (whole root).

2220380—Barbasco or cube root, and derris, tube or tuba root (formerly 2220360 and 2220370); advanced (powdered root).

Canada and Brazil, the leading countries of destination for fungicides other than copper sulfate, together received 24.7% of such shipments in 1958 and 20.6% in 1959.

The U.S. Tariff Commission has reported small imports of dichlone (or dichloronaphthoquinone)—1,014 lb. in 1957 and 95,289 lb. in 1958.

Shipments of copper sulfate for domestic agricultural use in 1959 were nearly as high as in the previous year (Table 14).

Production, however, amounted to only 80,584,000 lb. (see Table 1), lower than in any year since before 1937. Exports also were lower in both 1958 and 1959 than in any year since before 1937.

Since the sudden switch of Latin American banana growers to oil sprays in 1958, some areas have returned to the use of copper sulfate. This reversal of the trend appears yet to be rather spotty, Panama receiving 3,384,000 lb. or 63.3% of U.S. exports in 1959. Colombia, Costa Rica, Guatemala and Honduras together received 56,838,000 lb. in 1957, but only 946,000 lb. in 1959.

Mercury consumed in pesticide production in 1958 amounted to 6,270 flasks (476,520 lb.), or 12.1% of the total U.S. consumption of 3,940,000 lb. This figure includes usage for slime control in the pulp and paper industry. A current breakdown by the Bureau of Mines indicates that 55 to 60% of this mercury consumption is by that industry.

Production of phenyl mercuric ace-

TABLE 10. Imports of Organic Phosphorus Insecticides

Compound	1956 Pounds	1957 Pounds	1958 Pounds
Parathion	150,000	760,000	360,150
Methyl parathion	150,000	1,503,761	596,977
Guthion	34,804	274,590	83,000
Schradan	.....	3,381	9,698
Chlorthion	1,000	.....	.....
Bayer 21-199 ("Co-Ral")	265	3,633	203,204
Totals	336,069	2,545,565	1,253,029

Source: Chemical Division, U.S. Tariff Commission, "Imports of Coal-Tar Products."

TABLE 12. Pyrethrum Imports, 1958 and 1959

Exporting country	1958 Flowers Pounds	1958 Extract Pounds	1959 Flowers Pounds	1959 Extract Pounds
British East Africa	3,569,156	152,723	403,200	310,179
Belgian Congo	449,829	72,466	56,404	217,352
Ecuador	477,313	.....	511,315	1,438
Japan	.....	8,543	.....	14,201
Yugoslavia	152,948	.....	24,553	.....
Union of South Africa	56,000	12,000	.....	.....
Belgium	.....	10,000	.....	6,000
Peru	.....	.....	1,034	.....
Totals	4,705,246	255,732	996,506	549,120

Source: U.S. Bureau of the Census, Report No. FT 110.

TABLE 15. 2,4-D and Its Compounds in Commercial Production in 1958, Their Acid Content, and Number of Producers

Compound	Theoretical acid content Percent	Number of producers
2,4-D acid	100.000	6
Salts: Sodium (monohydrate)	84.675	1
Dimethylamine	83.059	5
Isopropylamine	78.901	1
Esters: Ethyl	88.738	1
Isopropyl	84.008	7
n-Butyl	79.757	7
sec-Butyl	79.757	1
Tetrahydrofurfuryl	72.436	1
2-Butoxyethyl	68.818	1
Iso-octyl	66.325	6
2-Ethylhexyl	66.325	4
Butoxyethoxypropyl	58.280	3
Butoxypolypropyleneglycol	.....	1

Sources: U.S. Tariff Commission, Pesticide Regulation Branch, A.R.S., U.S. Department of Agriculture (acid content).

TABLE 16. Solid Carriers and Diluents Consumed in Pesticide Formulations, 1956-58*

Materials	1956 1,000 lb.	1957 1,000 lb.	1958 1,000 lb.
Talc and soapstone	109,586	90,368	75,776
Pyrophyllite	86,264	84,332	84,570
Fuller's earth	228,854	134,954	170,552
Kaolin	80,480	78,300	72,398
Bentonite	37,694	37,486	60,584
Other	6,480	3,250	3,526
Totals	549,358	428,690	467,406

* Figures for 1959 not yet available.
Source: U.S. Bureau of Mines, Division of Minerals, Branch of Ceramic and Fertilizer Materials.

tate in 1958 was 1,056,000 lb., a jump of 85% over the 1957 figure. Production of other organic mercurial pesticides in 1958 amounted to 612,000 lb. Phenyl mercury acetate solutions are now used as antibacterial agents in water-base paints; older applications are in the control of weeds, turf and seed diseases, and slime organisms in pulp and paper mills.

Zinc sulfate shipments to agriculture in 1958 amounted to 11,525 short tons (gross weight), 34% of shipments for all purposes.

Production of pentachlorophenol in 1958 was reported by the Tariff Commission to be 35,177,000 lb.; sales by producers totaled 24,651,000 lb. The difference is probably indicative of captive uses such as the manufacture of sodium pentachlorophenate. Consumption of pentachloropenhol by U.S. wood-preserving plants in 1958 totaled 11,632,870 lb. (revised figure).

The number of chemical weed killers on the U.S. market, especially those of the pre-emergence type, grows steadily. Many preparations are designed for specific purposes, for instance, as crabgrass or chickweed killers for home lawn consumption. Pre-emergence herbicides are in increasing use in the Midwest on land in corn or soybeans. In fact, it is reported that in 1959 about 57% of commercial farmers used herbicides.

Corn accounted for more treated acres than all other crops combined. Corn acreage treated with pre-emergence herbicides in 1959 was more than twice that so treated in 1958. Almost twice as much cotton was treated as in the preceding year.

According to a survey of the herbicide market published last summer, types of herbicides applied on commercial farms are in the following proportions: post-emergence crop sprays, 51.7%; pre-emergence crop sprays, 6.8%; and pasture weed and brush sprays, 41.5%.

The Minnesota Department of Agriculture, Dairy and Food reported that in 1950 only 13.3% of grain grown in the state was treated. Treatment of grain acreage has grown steadily there until in 1959 the percentage was 44.6%.

A relatively large quantity of sodium chlorate is consumed annually for weed control and defoliation. The U.S. Department of Commerce estimates that about 33,000,000 lb. go into herbicide preparations and 5,000,000 lb. into defoliants for use on cotton and soybeans. These uses comprise about 25% of U.S. sodium chlorate consumption.

Borates are mixed with sodium chlorate at the rate of about .72 lb. of borate to each pound of chlorate to overcome the fire hazard of the latter. It has been estimated that the total quantity of borates consumed in herbicides and defoliants annually is about 50 million pounds, some being used by themselves in weed control.

Production of 2,4-D acid was appreciably lower in 1959 than in the preceding year, while 2,4,5-T was produced in larger amount. A list of 2,4-D compounds with theoretical acid equivalents and the number of plants in which each was produced commercially in 1958 is shown in Table 15.

Exports of 2,4-D and 2,4,5-T together (acid basis) were 14% less in 1959 than in 1958. At the same time exports of other herbicides (gross weight) were down 29%. The value of 2,4-D and 2,4,5-T exports amounted to 40% of the value of all herbicide exports in 1959. Canada is the leading destination for U.S. exports of weed killers.

Stocks of 2,4-D and 2,4,5-T were lower at the end of the last growing season than at the same time in 1958 and domestic consumption apparently was much higher than ever in the history of these chemicals.

Maleic hydrazide for the most part a growth inhibitor rather than a weed killer, has become a factor in saving certain labor costs. More important uses are as an inhibitor of sucker growth in flue cured and burley tobacco crops, and of grasses on utility sites and along roadways. It is used also in the control of wild onion and wild garlic in pastures and of quackgrass in corn. Formerly it was applied to potatoes and onions to inhibit sprouting in storage.

U.S. exports of fumigants in 1959 amounted to 3,678,000 lb., valued at $1,065,000. On a dollar basis, this was only 4.2% lower than in 1958, the first year of record.

Refined naphthalene for household use in protecting stored woolens is in tight supply, reflecting the short supplies of crude naphthalene brought about by the steel strike of last year.

Materials intended to be added to stored grain to protect it from insect damage for a considerable period now include certain pyrethrum-piperonyl butoxide ("Pyrenone") mixtures, preparations containing a premium grade malathion and aluminum phosphide tablets ("Phostoxin").

In 1958 the consumption of dust carriers and diluents in pesticide preparations rose above the 1957 level but did not reach that in 1955 or 1956 (Table 16).

Any appreciable shift from dusts to liquid sprays would tend to diminish the demand for solid diluent materials. On the other hand, use of granular preparations has expanded until it now probably comprises 20 to 25% of all use of solid diluents in pesticides.

TABLE 9. Exports of 75% DDT to Some Principal Asiatic Destinations (100% Basis)

Country	1958 Pounds	1959 Pounds
India	22,559,248	29,950,562
Indonesia	2,231,025	2,320,875
Vietnam	195,000	1,592,625
Philippines	44,000	1,070,210
Thailand	237,683	152,989
Nepal	7,500	138,000

Source: U.S. Bureau of the Census, Report No. FT 410, Part II.

TABLE 11. Inventories of Parathion and Methyl Parathion on Sept. 30 (All Reports; Unpaired)

Material	1958 1,000 lb.	1959 1,000 lb.
Parathion:		
Technical	1,646	1,035
Formulated	1,640	1,273
Total	3,286	2,308
Methyl parathion:		
Technical	2,722	1,010
Formulated	463	237
Total	3,185	1,247

TABLE 13. Imports of Rotenone-Containing Root (Cube and Derris)*

Period By calendar Year:	Weight Pounds	Value Dollars
1950	10,013,333	1,080,751
1951	6,762,249	854,450
1952	2,852,826	328,198
1953	5,643,472	655,014
1954	6,435,944	738,545
1955	5,580,549	806,544
1956	6,956,259	1,183,399
1957	4,894,939	873,282
1958	4,826,595	729,189
1959	5,930,683	816,599
By crop Year:		
1957-58	4,140,145	635,166
1958-59	5,975,384	866,116

* Figures include both whole and powdered root.

Source: U.S. Bureau of the Census, Report FT 110.

TABLE 14. Copper Sulfate Shipments by Calendar Years

Use	1957 1,000 lb.	1958 1,000 lb.	1959 1,000 lb.
Agricultural	31,328	41,608	38,824
Industrial	41,648	36,280	38,344
Other (chiefly export)	67,536	15,272	7,032
Totals	140,512	93,160	84,200

Source: Producers' reports to U.S. Bureau of Mines.

CALIFORNIA GROUP

(Continued from page 1)

Improvement Committee, California Fertilizer Assn. Dr. Ulrich, who has developed accurate diagnostic techniques for determination of nutrient deficiency levels in sugar beets and other crops, will publish his findings on bean diagnosis when his project has been completed.

Dr. Duane S. Mikkelsen, Department of Agronomy, University of California, said that the combination of California's barley, wheat and oat crops is produced on about two million acres, and has a value of $106 million. This is a larger acreage than any other crop, and covers a wider range of California geography, soil and climatic conditions than any other crop.

L. K. Stromberg, Fresno County farm adviser, presented a report concerning the value of potash in cotton fertilization research which has been going forward in the San Joaquin Valley for the past several years. He said that symptoms of potash deficiency in cotton have been recognized in spots over a wide area on the east side of the San Joaquin Valley, specifically in Fresno, Kern, Tulare, Kings and Madera counties.

Mr. Stromberg reported a 1959 test plot in a field which had exhibited deficiency symptoms as well as low potash in the plant tissues, during the 1958 season. One hundred thirty-five pounds of nitrogen per acre in the form of ammonium sulfate was applied to all plots and 245 lb. of potash (K_2O) as potassium sulfate were applied, except to a check plot. The check plot produced 977 lb. of lint cotton per acre, and the potassium plots yielded 1,184 lb. of lint, a highly significant increase of 207 lb. of lint per acre.

DeWitt Bishop, assistant chief, California Bureau of Chemistry, reported on fertilizer and pesticides from a regulatory viewpoint. In 1959, the bureau analyzed 3,409 official commercial fertilizer samples and 554 agricultural minerals samples. In addition 2,199 pesticide samples were analyzed, as were 2,263 lots of fruits, vegetables, fodder and hay. A total of 457 firms were registered to sell commercial fertilizers in 1958-59, and 2,543 licenses were issued to fertilizer salesmen.

Tonnage of commercial fertilizers sold in California has increased from 58,636 in 1920, to 1,286,756 in 1959.

The panel discussion on legume fertilization attracted much interest and audience participation. R. L. Luckhardt, Collier Carbon and Chemical Corp., Los Angeles, was panel moderator. Panel members were Dr. William E. Martin, Dr. Merton Love and Victor P. Osterli, all of the University of California, Davis; Dr. William L. Garman, the Best Fertilizers Co., Lathrop; and Dr. Malcolm H. McVickar, California Spray-Chemical Corp., Richmond.

New Fertilizer

RICHMOND, VA.—Virginia-Carolina Chemical Corp. is introducing a new fertilizer this spring and backing it with the most intensive advertising campaign in the company's history, a spokesman said.

The new product—V-C Harvest King—will be sold from all of V-C's 23 sales offices across the eastern two-thirds of the country.

Chief difference between Harvest King and V-C's regular fertilizer is that the new product is fortified with a combination of six trace elements crops require, the company says. These elements will be added to the fertilizer via an exclusive mineral mix the company calls "Vitel."

Warren S. Wolf Joins U.S. Borax Marketing

LOS ANGELES — Appointment of Warren S. Wolf to the marketing department of U.S. Borax & Chemical Corp. was announced by M. H. Pickard, director of market development and technical services.

Warren S. Wolf

Mr. Pickard said Mr. Wolf, who has been assigned to the company's New York offices, has had considerable experience in the development of new specialty catalysts for the oil and ammonia industries and with the sales development of boron, lithium, rare earth chemicals and new products.

A graduate of Lehigh University, Mr. Wolf holds an A.B. degree in liberal arts and a B.S. degree in chemical engineering.

BOLL WEEVIL

(Continued from page 1)

to date is reported from northeast Louisiana. Other high-count areas include central Texas (2,065 per acre); Florence County, South Carolina (1,560 per acre); Mississippi's central and lower delta areas (1,353 and 1,088 per acre, respectively); and the coastal plains of North Carolina and South Carolina (1,049 per acre). Only in the Carolina Coastal Plains and in the north central section of North Carolina are 1960 counts lower than counts last spring.

In Madison Parish, Louisiana, an important cotton-producing area of the state, the number of boll weevils per acre (4,721) surviving winter hibernation is the highest for the 24 years in which records have been kept.

Counts of live weevils are made, each fall and spring, in samples of wood trash taken from selected locations near cotton fields. Per acre estimates are based on the number of adult weevils found in samples.

The Cooperative Insect Report, published April 15 by USDA's Agricultural Research Service, contains details on the survey from the five states reporting so far.

The percentage of weevils surviving the winter ranges from only 6.67% in Mississippi's north delta area to 96% in Madison Parish, Louisiana. The number of weevils taking winter cover last fall was generally higher than in the fall of 1958.

In a three-parish area of northeast Louisiana, the 4,748 live weevils found per acre this spring compare with 2,246 in the spring of 1959.

The average for all of Mississippi is 821 weevils per acre compared with 464 in the spring of 1959 and 392 in 1958. The per acre average in the lower delta area is 1,088 this year and was 781 last spring; in the central delta, 1,353 compared with 364; in the north delta, 338 compared with 284; and in the hill section, 504 compared with 429.

Survival counts in North Carolina and South Carolina were made in four areas of the two-state region. In south-central South Carolina, the average number of weevils found this spring is 861 compared with 699 a year ago. In the Coastal Plain area of both states, comparable counts are 1,049 and 1,963; in the Carolina Piedmont area, 590 and 242; and in north central North Carolina, 377 and 81.

In Florence County, South Carolina, the 1,560 per-acre count is 28.7% of the weevils entering hibernation last fall. Since 1947, weevil counts have been lower only in 1952, 1957, and 1958.

Croplife®

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

Favorable Pesticide Situation Report From USDA Indicates Additional Sales in 1960

SEVERAL particularly interesting facts are pointed up in the "Pesticide Situation" report just issued by Harold H. Shepard and his group in the Commodity Stabilization Service of the U.S. Department of Agriculture. This report, compiled from a number of sources, indicates first that supplies are expected to be adequate for normal demands of the 1959-60 crop year which ends Sept. 30. It makes this side observation, however, that this situation will be true "barring unexpected demands."

That is, of course, characteristic of the industry. Who can sit down at the beginning of a season and plan accurately on what the bugs and weather will do . . . not to mention farm economics? So many variables are thrown into the hopper that it is next to impossible to come up with an answer that is much more than an educated guess.

The industry has seen years where practically all manufacturers decided it would be a good season for pesticide sales: winter survival of important insects was high; weather outlook favorable for development of infestations; large acreages of susceptible crops planted and other "signs" pointed to great demand. Sometimes these years paid off and great was the joy expressed. Other times . . . well, there have been a few black years which many in the trade would like to erase from memory.

In 1959, the report says, production of all synthetic pesticidal chemicals will probably be higher than the 539,396,000 pounds compounded in 1958. The exact figure for 1959 will not be known for another several weeks, but Mr. Shepard indicated that the total might be close to the record of 569,927,000 pounds produced in 1956.

Along with the heavy production of pesticidal materials was carryover about equal to that of Sept. 30, 1958, with many commodities being considerably under last year's inventory figure. Acid basis 2,4-D had an inventory of only 46% of the 1958 stock; 2,4,5-T, 86%, but "other herbicides" aggregated a carryover of 156% of last year's.

An encouraging word is noted in the report. That is, insect infestations during 1959 were normal generally throughout the U.S., but in spite of this, pesticide sales were higher compared to 1958. This increase was the result of greater use of soil insecticides, miticides, pre-emergence herbicides, and nematocides.

Having found benefit from use of such products, farmers are likely to get the habit of applying them year after year. Every year is a "good year for weeds" and the soil-inhabiting pests are with us always. Thus, many people interested in marketing and sales, feel that this phase of the pesticide business is potentially more steady than are some of the others.

Grasshoppers in 1959 failed to cooperate by appearing in overwhelming numbers. Last year's total acreage treated for this pest was 766,478, but in 1958 when swarms of the 'hoppers infested huge areas, some 4,338,329 acres of range, roadside and wasteland were treated in the cooperative federal-state grasshopper control program.

Another agricultural pest usually relied upon for use of large quantities of pesticidal chemicals is the European corn borer. Its spread during 1959 was limited and the fall abundance survey showed that populations of the insect were generally lower in the central part of the nation where their presence bears the most significance. In the eastern portions of the country, however, their populations were generally higher than in 1958.

Fire ant control efforts also contributed to the total business garnered by the insecticide trade last year. Some 931,981 acres were treated for this controversial pest during 1959. Applications to halt it have met with resistance from wildlife people, but the project so far is being continued through means of cooperative financing from federal-state-local sources. Individual property owners have also applied pesticides to keep the hot little pest from overrunning their farms and city yards.

Still another contributor to pesticide use in 1959 was the U.S. Forest Service which utilized insecticides to suppress defoliator infestations last year. Although the amounts of toxicants used were not as great as in some past years, the totals were nonetheless considerable. Attempts to stop the bark beetle used more pesticides than before.

Herbicide use remained about the same, the Shepard report indicates. This is another area where the potential use by the U.S. Forest Service is tremendous.

Spruce budworm infestations on 134,121 acres in Montana and Minnesota were treated last year by aerial spraying with DDT at the rate of one pound to the acre. The same treatment was applied aerially on 44,851 acres against other forest pests such as Douglas fir tussock moth in Arizona and New Mexico, jack pine budworm in Minnesota, sawflies in Texas and Louisiana, elm spanworm in Georgia, Saratoga spittlebug in Wisconsin and Michigan, and pine reproduction weevil in California.

With the entire Shepard report appearing elsewhere in this issue of Croplife, it is unnecessary to quote additional figures in detail, but the whole tone of the compilation is one of apparent optimism concerning the pesticide outlook for the current season.

The numerous variables can easily throw their weight against the promising outlook, but from the looks of things at this point, next year's report will verify the fact that we are beginning a good year right now.

New Concept of Time

A new calendar has been proposed for people in the agricultural chemical business, according to a note in the information bulletin of the Agricultural Aircraft Assn., Fresno, Cal.

The new concept of time would be calculated thus:

1958—1 B.C. (Before Cranberries)
1960—1 A.D. (After Delaney-amendment)

The idea may not be as far-fetched as one might think. It is likely that for years to come, business will be affected by these two influences.

QUOTE

"Through the advance of modern means of transportation, diseases now travel faster than ever before, and this necessitates closely-organized combat power to fight against man's worst enemy. . . . Without mosquitoes and flies, there will be almost no diseases to fear."—Dr. Chang Whan Sohn, Minister of Health and Social Affairs, Republic of Korea, in address observing ninth World Health Day.

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Croplife®

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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop area) basis with a mailing schedule which covers consecutively, one each week, three geographic regions (South, Midwest and West) of the U.S. On the fourth week, production personnel in fertilizer manufacturing and pesticide formulating plants throughout the U.S. are covered in depth. To those not eligible for this controlled distribution, Croplife's subscription rate is $5 for one year ($8 a year outside the U.S.). Single copy price 25¢.

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May 10—Fertilizer Industry Conference, Chamber of Commerce, Fairmont Hotel, San Francisco.

June 1-2—Conference on Roadside Erosion Control, Cartersville, Ga.

June 9—Executive Committee Meeting, Fertilizer Section, National Safety Council, College Inn Motor Lodge, Raleigh, N.C.

June 25—Del-Mar-Va Peninsula Fertilizer Assn., Annual Convention, George Washington Hotel, Ocean City, Md.

Aug. 10-11—Northeast Regional Fertilizer Safety School, Park Sheraton Hotel, New York City.

Aug. 16-17—Midwest Regional Fertilizer Safety School, National Safety Council Headquarters, Chicago.

Aug. 25-27—Southeast Regional Fertilizer Safety School, Wilmington, N.C.

Meeting Memos listed above are being listed in this department this week for the first time.

June 7—Field Day, University of Maryland Agronomy-Dairy Forage Research Farm, Ellicott City, Md.

June 9-11—Manufacturing Chemists' Assn. 88th annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 12-15—National Plant Food Institute annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 13-16—Western Society of Soil Science meeting, University of Oregon, Eugene, Oregon.

June 21-22—Eighteenth Annual Convention, Association of Southern Feed & Fertilizer Control Officials, Riverside Hotel, Gatlinburg, Tenn. For further information, write Maurice B. Rowe, secretary-treasurer, Department of Agriculture, 1119 State Office Building, Richmond 19, Va.

June 27-29 — Northwest Section, American Society of Range Management summer meeting, John Day, Oregon.

June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

July 11-13—North Central Agronomy Society, Summer meeting, University of Minnesota Farm Campus, St. Paul, Minn.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

July 27-30—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Aug. 2-3 — Ohio Pesticide Institute, Ohio Agricultural Experiment Station, Wooster, Ohio.

Aug. 15-23 — Seventh International Soil Science Congress, University of Wisconsin, Madison, Wis., Prof. Emil Truog, Congress Manager, Soils Building, College of Agriculture, Madison 6, Wis.

Aug. 21-25 — Canadian Fertilizers Assn., annual convention, Manoir Richelieu Hotel, Murray Bay, Quebec, Canada. H. H. Skelton, P.O. Box 147, Hochelaga Station, Montreal, Que., Canada, general chairman.

Aug. 25-27—Mississippi Soil Fertility and Plant Food Council, 1960 meeting, Buena Vista Hotel, Biloxi, Miss.

Sept. 24-26 — Western Agricultural Chemicals Assn., 31st annual meeting, Palm Springs Riviera Hotel, Palm Springs, Cal.

Sept. 27-29—Annual meeting of National Agricultural Chemicals Assn. for 1960, Hotel del Coronado, Coronado, Cal.

Sept. 29-30—Northeast Fertilizer Conference, Hotel Hershey, Hershey, Pa.

Oct. 5-6—Southeast Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 10-11 — Second Annual 4-State Aerial Applicators Conference, Hotel Chinook, Yakima, Wash., Norkem Corp. is sponsor.

Oct. 17-21—48th annual National Safety Congress, Fertilizer Section, LaSalle Hotel, Chicago.

Oct. 31-Nov. 3—International Crop Improvement Assn. meeting, Denver, Colo.

Nov. 3-4—Annual fall convention, Pacific Northwest Plant Food Assn., Boise, Idaho.

Nov. 9-11—National Fertilizer Solutions Assn., 1960 Convention, Memphis, Tenn.

Nov. 13-15—California Fertilizer Assn., 37th annual meeting, del Coronado Hotel, Coronado, Cal.

Jan. 11-13 — Agricultural Ammonia Institute, 10th annual convention, Memphis, Tenn.

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Former Monsanto Executive Dies of Heart Disease

ST. LOUIS—Francis J. Curtis, 65, retired vice president for personnel and former member of the board of directors of Monsanto Chemical Co., died recently of heart disease in Barnes Hospital here. He would have been 66 April 22.

Mr. Curtis, who retired from Monsanto on April 30, 1959, had been with the company for 44 years. He started in 1915 with the old Merrimac Chemical Co., Boston, which was acquired by Monsanto in 1929.

In 1939, Mr. Curtis was appointed director of development for the company, and in 1943 he was elected a vice president and named secretary of Monsanto's executive and finance committees. He was elected to the board of directors in 1949.

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(Discussing promising new insecticide compounds at Hercules' Agricultural Chemicals Laboratory are: George Buntin, discoverer of toxaphene; Dr. E. N. Woodbury, laboratory supervisor; Dr. Keith D. Ihde, research entomologist; Dr. Arthur D. Lohr, supervisor, Naval Stores research; and Dr. William R. Diveley, a discoverer of Delnav.)

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Continuous research is carried on by Hercules Powder Company to find new chemicals for agriculture, and to find better ways to utilize the tools now available. Many of the people doing this work were engaged in the original development of toxaphene. Besides laboratory research, Hercules has placed great emphasis upon field testing and large-scale demonstrations. From such applied research in cotton insect control, for example, has come information to help farmers get better yields while lowering their production costs.

TOXAPHENE

Agricultural Chemicals Division, Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
Wilmington, Delaware

HXBO-1